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Future
MEDIA WITH PASSION

Ed Word

Bring on the PC of Tomorrow

Please send feedback and beignets to ***will@maximumpc.com.***

I've always enjoyed William Gibson's cyberpunk novels, not just for their entertaining plots and fantastical settings, but also for the way Gibson describes the fantastic computers of the not-too-distant-future. His descriptions are an indictment of the lazy, assembly-line PCs we all use today.

Gibson's PCs feature processors, memory, and network connections—all the usual stuff. But in addition to providing storage and processing power, the rigs reflect the unique sensibilities and aesthetics of their users—usually via a unique custom design.

Sadly, the modern real-world PC has the same basic design as the earliest PCs—it's just been dolled up. Laptops might come in 50 different colors, but they still feature the same clamshell design as the first portable computers, which were introduced nearly 30 years ago. Contrast this with Gibson's computers, which come in a variety of shapes and materials.

Even our Rig of the Month winners—who are at the forefront of novel PC design—are building machines that use the same basic designs engineers have used since the dawn of personal computing. That's not entirely their fault, as modders are limited to the hardware they can buy, beg, borrow, or steal. But system manufacturers don't have any valid excuses. They have access to all the resources that would allow them to develop new, innovative designs.

Let's look at laptops. Every rig contains the same three user-interface elements: a screen, keyboard, and pointing device, plus all the other hardware that we don't access very often, the hard drive, for example. Each of these components has different requirements and limitations, so why do we pack them all into the same frame? Your laptop's CPU, videocard, and memory generate oodles of heat, so why don't we separate them from the parts you actually use? The technology to do just that is available today, even wirelessly, but no one has put the pieces together.

Desktop design is just as stagnant. Shopping for a desktop PC is like visiting a furniture store that stocks nothing but mid-'70s bachelor-pad designs. Why doesn't someone build enclosures that go with an antique desk? Why must every PC be constructed of black plastic and chrome? Is there really no quieter, more efficient case design than ATX?

Did the engineers who built the first PCs more than 30 years ago really get it right on the first try? If they didn't, why are we still using their designs? If my car were designed by the same dudes who design PCs, I'd be driving a neon pink horseless carriage that does 0–60mph in three seconds flat.

Will Smith

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MAXIMUM PC

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DirectX 10 Status Report

Vista? ✓
DX10 videocard? ✓
DX10 games? Cue crickets

You can't buy a DX10 game, but screenshots such as this one from Massive Entertainment's World in Conflict are driving plenty of DX10 videocard sales.

It's fortunate that the first DX10 videocards—Nvidia's GeForce 8800 boards—kick ass with DX9, because that's the only kind of gaming we'll see for a while. Conversations with representatives from Crytek, Microsoft, Nvidia, and other developers at the Game Developers Conference in San Francisco last March lead us to conclude that it will be far into 2008 before DirectX 10 games become the norm.

When you consider that ATI and Nvidia have been introducing entirely new generations of GPUs every six months, the GeForce 8800 GTX card you just dropped $500 on could be a mere also-ran when DX10 games become ubiquitous. That's not to say we won't see *any* DX10 games this year. Relic is working on a DX10 patch for Company of Heroes, and ACES is doing the same for Microsoft's Flight Simulator X. Chris Donahue, Microsoft's group manager for Games for Windows, went so far as to tell us he expects two or three games to ship by June—but he couldn't say what they'd be.

And then there's Crysis. Although no one's willing to commit to a hard date, the general consensus is that the game will ship some time in 2007. And while it will run on either DX9 or DX10 hardware, Harald Seeley, Crytek's development director, told us the DX10 version will deliver all the eye candy. "Having DX10 won't change the core gaming experience," said Seeley, "but it does enable us to increase the density of the foliage, add more particles, and deliver better smoke. We're still learning how much more we can get out of the API."

"We've added a new layer of complexity to the API," said Microsoft's Donahue. "You see the same thing with gaming consoles. The first generation of games looks a little better, but it takes a while for people to learn how to work with the new platform." As for those supremely impressive tech demos that Nvidia has been showing the press and the public, "I used to work at Nvidia," Donahue said, "those demos are spit and tissue paper." (Donahue didn't say so, but we expect much the same from ATI when its DX10 parts and tech demos ship.)

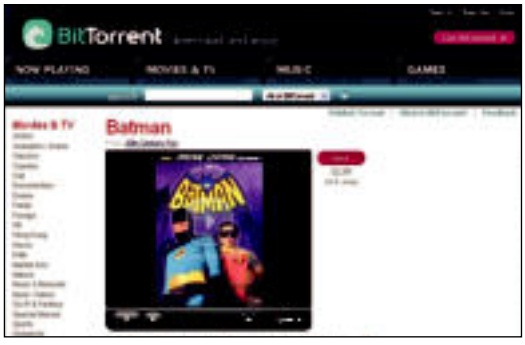
Here's something else we learned at GDC: We all know that the only way to get DirectX 10 is to buy Vista, but there's actually nothing about the new API that would prevent Microsoft from releasing a version for Windows XP, although that's unlikely to ever happen. "That wasn't just a business decision," said Donahue. "We wanted to make Vista a dividing point between DX9 and DX10, so we could leave the legacy content behind. And Vista offers a lot of benefits beyond DX10 games. I think there's enough value in the stability and performance it offers."

Nvidia's top-shelf 8800 GTX could fall into the midrange of the market by the time DirectX 10 games become ubiquitous.

BitTorrent Cashing In?

Popular P2P client hopes people will pay for downloads

Once the scourge of the entertainment industry, BitTorrent is now teaming up with a number of major content providers to deliver movies, TV shows, and games legitimately over the Internet. BitTorrent's P2P network protocol, which enables large-file distribution by sharing the load among multiple users, has been a favorite of copyright violators for years. Whether users are willing to pay for movie rentals delivered via torrent is another story. Rental prices are comparable to those of similar services—$1.99 for TV episodes and $2.99 to $3.99 for movies—but content is viewable for just 24 hours after first hitting Play, and playback is restricted to a single PC. All content is standard definition, and all paid content is protected with Windows Media DRM.



At BitTorrent.com you can watch previews of your selections before plunking down cash.

RIAA Targets Universities

It's the time of year when students are awaiting college acceptance notices and deciding which school to attend in the fall. Perhaps they'll be swayed by the RIAA's recently released list of the top 25 music-pirating universities—Ohio University, Purdue University, and the University of Nebraska hold the one, two, and three spots, respectively. Rankings are based on the number of "take down" notices the RIAA has sent to each institution this academic year, and the 15,000 notices issued so far is triple the number sent last year.

Because the RIAA can't identify individuals, just IP addresses, it counts on the schools to notify students and warn them of potential litigation. But even these measures might soon be unnecessary. The RIAA is fine-tuning the Automated Copyright Notice System (ACNS), which will automatically email a peer-to-peer network miscreant and cut off his or her Internet service.

Masters of Case Craft Join Forces

Smooth Creations applies its case-painting skills to two popular Cooler Master enclosures

Smooth Creations and Cooler Master are offering three paint designs to choose from on the CSX Stacker 830 (pictured here) for a mere $900. Jedi should know a Star Wars–themed CSX Mystic 632 fetches just $700. See www.coolermaster-usa.com for more details.

TOM **HALFHILL**

Multithreaded Booby Traps

Ask programmers what they fear most, and one answer is the hidden fatal bug—a serious programming error so deeply embedded in their code that it could go undiscovered for years. Then, suddenly, a program thought to be rock-solid just crashes and burns.

Consider what happened early this year when the U.S. Air Force tried to fly the first brand-new F-22 fighter planes to Japan. Halfway across the Pacific, the high-tech jets crossed the international date line. Suddenly, their navigation and communications systems crashed and refused to reboot. The most advanced (and expensive) warplanes in the world were helpless. The crippled fighters had to follow their air tankers back to Hawaii. Later, programmers found a software bug that choked the onboard computers when the compass heading instantly switched from 180 degrees west to 180 degrees east.

Do similar bugs lurk in our PCs? Duh! And new bugs are coming from an unexpected source.

Dr. Edward A. Lee, an engineering professor at the University of California, Berkeley, has written a well-researched but troubling technical paper, "The Problem with Threads." Lee found that multithreaded programs running perfectly on single-processor systems could behave differently or even freeze on multiprocessor systems. In fact, Lee's group carefully wrote and tested an experimental program that ran without problems on a single processor for four years. Then, one day, it simply froze. The problem: a thread deadlock, or "threadlock," that appeared when the program ran on dual processors.

Threadlocks happen when two threads of execution within a program contend for the same code. They block each other, sometimes halting the program. Threadlocks are well known and programmers commonly test for them. What's scary is that the university's experts believed they had eradicated all possible threadlocks from their program—a belief reinforced by four years of trouble-free operation. But dual processors spelled doom.

From the software's point of view, a dual-core or dual-threaded processor looks like a dual-processor system. PCs with dual-core processors are now commonplace, and quad-core processors are becoming popular. As programmers write increasingly complex multithreaded code to take advantage of these multicore systems, threadlocks that were hidden on smaller systems will begin causing more strange behavior and mysterious crashes.

Tom Halfhill was formerly a senior editor for Byte magazine and is now an analyst for Microprocessor Report.

GAME THEORY

THOMAS MCDONALD

Live! (For a Price)

It doesn't take much to get gamers speculating. Heck, we're *gamers*, and speculation is just another kind of mind game. For example, it takes just a brief two-second splash screen at the end of a game trailer to get people talking about the future of online gaming.

Those two seconds come at the end of the new trailer for Shadowrun, an impressive-looking multiplayer shooter coming from Microsoft and FASA. At the bottom of the screen, as a voice-over announces cross-platform gameplay between Windows Vista and Xbox 360, this line appears: "Cross platform play requires Xbox Live Gold account and hard drive (on Xbox 360) or Games for Windows Live Gold account (on Windows)." And that can change the entire equation of online multiplayer gaming.

We've been hearing some rumblings about "Live Anywhere" for a while now. It ships with Vista, but full functionality is being implemented gradually. Games for Windows Live will be a part of that implementation. We can look at the Xbox Live model and reasonably speculate that Games for Windows Live Gold will be a subscription service providing a marketplace, lobbies, casual games, and connectivity for multiplayer gaming.

Did you catch the key word in that previous sentence?

Sure you did. It's "subscription." Xbox Live Gold costs $50 a year and is the only way Xbox owners can compete online against other players. The free version of Xbox Live offers a limited number of features, such as trailer and demo downloads, and no matchmaking for multiplayer.

Console gamers have been conditioned from the beginning to view multiplayer connectivity as a premium service. PC gamers have not. We play free on any server with low lag, and we not only like it, we expect it. If the MMO boom has taught us anything, however, it's that there's gold in them thar hills, and hefty profits to be made hooking gamers up to each other.

The question remains: Will the consolidation of PC gaming under "Games for Windows" branding (even for non-MS titles) eventually lead to a new set of standards in which all PC multiplayer gaming is passed through a subscription service? Is the free ride finally coming to an end?

Tom McDonald has been covering games for countless magazines and newspapers for 11 years. He lives in the New Jersey Pine Barrens.

ON THE NO BS PODCAST
www.maximumpc.com

Like We Need More Reasons to Game

At *Maximum PC* we're well aware of the importance of computer gaming. We can get downright cranky and unproductive when denied our fill of Supreme Commander or Rainbow Six. But two new studies show that regular game playing provides more benefits than just the sheer pleasure of stalking an opponent and blowing him to bits.

A recent study submitted by researchers at Beth Israel Medical Center in New York found that video game skill correlates with laparoscopic surgery skill. (Do we sense a new calling?) The 33 surgeons participating in the study were questioned about their past and present game-playing habits and also observed while playing three different games. The information was compared with the participants' performance in simulated laparoscopic surgery drills. The upshot: Surgeons who clocked more than three hours per week playing games made 37 percent fewer surgery errors, performed 27 percent faster, and scored 42 percent better overall than their non-game-playing counterparts. Those in the top one-third of game performance skills made 47 percent fewer surgery errors, performed 39 percent faster, and scored 41 percent overall.

In another study, researchers at the University of Rochester found that action-packed video games can improve a player's eyesight by approximately 20 percent. Participants were tested for visual acuity and then broken into two groups: One group played Unreal Tournament almost daily for a month, while the other group played Tetris on the same schedule. The UT group had significantly improved scores, while the Tetris group's scores were unchanged.

Budget Quad Core

Intel underwhelmed budget shoppers with its "friendlier priced" Core 2 Quad E6600 CPU, which d $850, just $150 shy of the $1,000 quad part, but there are hints that Intel might soon introduce an even cheaper quad core.

On MSI's website, the company's Core 2 boards were deemed compatible with both the 2.4GHz Core 2 Quad E6600 and an as-yet-unreleased 2.13GHz Core 2 Quad E6400.

Virtual PC 2007 Arrives

Offering support for Intel's and AMD's hardware virtualization as well as the ability to run Vista, Microsoft's Virtual PC 2007 is out of beta and available for free download at Microsoft's website. But the release is not without controversy.

Market leader VMware has accused Microsoft of fighting unfairly by preventing it and other virtualization-software makers from accessing Microsoft's proprietary VHD format and using restrictive licensing and support tactics to hurt the competition. VMware could previously open virtual machines created for Virtual PC and Virtual Server, but no longer can—something akin to being able to open Microsoft Word docs in Word but not WordPerfect.

WiLife Spy Camera

TESTED & GEEK APPROVED

You can't get much geekier (or is that creepier?) than a network spy camera, but we're giving this one only a qualified thumbs up. We dig its resolution (up to 640x480), feature-packed software (which supports as many as six cameras), and HomePlug networking support. But it's so ginormous and so freakin' ugly that no one will believe it's an ordinary clock.

$300, www.wilife.com

Introducing Yahoo Pipes!

A graphical interface for searching, scraping, and sorting data online? Sounds rad!

There's an unbelievable wealth of information floating around the Internet today. You can find anything you want—from apartment listings to a good place to have a beer—but it's been difficult to cross-reference information from different sources. To find an apartment near Golden Gate Park on Craigslist you have to look at each entry and then consult Google Maps to find its location or build a custom web app.

Yahoo's beta Pipes service (**pipes.yahoo.com**) lets you strip data from different sources—including all RSS feeds—and then feed that data to a different website as an input. You can create your own pipes using the simple graphical interface, or use the thousands of preconfigured pipes that are already available.

Preview

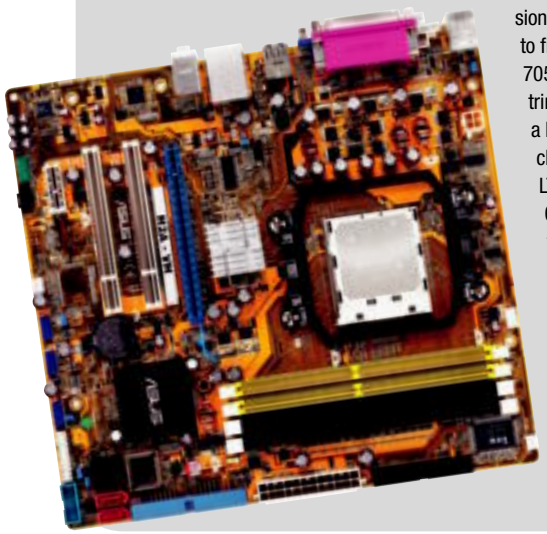
AMD, Nvidia Chipsets Offer HDCP Support

Finally, a feature that makes integrated graphics an attractive prospect

Building a home-theater PC that can play high-definition content should get significantly cheaper this summer. Both AMD and Nvidia have introduced chipsets with integrated graphics that support HDCP.

AMD's 690G uses the same graphics core as the ATI X1250 Intel version, which was released last August. Of course, the post-merger chipset now supports AMD's AM2 processors. (A version without HDCP support, dubbed 690V, is available for business desktops and budget boxes.) AMD's 690G AM2 chipset supports DDR2 and uses the SB600 south bridge with SATA and Gigabit support.

Meanwhile, Nvidia has its own HDCP-enabled integrated part, the 7050PV chipset. While the Intel version of AMD's chipset might be difficult to find, Nvidia says it will offer the 7050PV chipset in both AMD and Intel trim. Nvidia also says it plans to have a budget version of its popular 680i chipset this summer. Called the 680i LT SLI, the chipset will offer dual x16 GPU support but will omit support for the third x16 PCI-E slot and doesn't support RAM overclocking.



Asus's AM2 board using the 690G chipset can play HD content without the need for a pricey HDCP videocard.

FUNSIZENEWS

LAPTOP PHONE HOME

Thanks to SETI@home, one volunteer in the distributed-computing project was able to recover a stolen laptop. SETI@home software taps the CPU cycles of participants' idle PCs to crunch numbers in the search for extraterrestrial life. While space aliens remain at large, the project's servers recorded the IP address of the stolen laptop running SETI@home, leading authorities to the thief.

DELL DUMPS OS

Visitors to Dell's newly launched IdeaStorm website sent a loud and clear message they want an alternative to the Windows OS. After more than 150,000 consumers posted requests for preinstalled Linux or OpenOffice PCs, Dell took swift action by expanding its OS-free line of PCs to include Latitude notebooks in addition to OptiPlex desktops and Precision workstations. So folks are now free to run their alternative OS of choice.

CISCO AND APPLE MAKE NICE

Apple's much celebrated iPhone unveiling in January would have been an unmitigated success were it not for the lawsuit Cisco filed a day later over rights to the iPhone trademark. Cisco has owned the name since 2000 and has even used it on a line of Linksys VoIP phones. But the two companies have patched up their differences and agreed to use the iPhone brand on both their products and "explore opportunities for interoperability." Further details about the settlement are shrouded in mystery.

PODCAST ALERT!

New findings show that listeners of *Maximum PC*'s No BS podcast are 47 percent more likely to possess knowledge of the latest PC-related news and trends than nonlisteners. Of course, they're also more likely to be left speechless by Senior Editor Gordon Mah Ung's weekly rants. To get the podcast, point your podcast reader at **http://feeds.feedburner.com/maximumpc/1337** or check the podcast section of iTunes.

Cone Speakers **vs.** Flat-Panel Speakers

We've seen very little change in basic speaker design over the years: Nearly every speaker system we've tested has consisted of a cone driver inside a box. The only other design to make its way into the types of audio systems you'd pair with a PC or MP3 player has been the flat-panel transducer developed and licensed by NXT. Why hasn't this glitzy technology made further inroads against the boring old cone?

To satisfy our curiosity, we asked NXT to recommend the best example of its technology that could be purchased at retail. And then we scratched our heads when the company recommended two products we'd ripped in earlier reviews. When Tascam was unable to resend us the 2.1-channel VL-S21 speaker system we *did like,* we asked NXT to send us the closest product to it: It came up with Brookstone's Wafer-Thin CD/MP3 Shelf System (yeah, we cringed too, but the speakers use genuine NXT technology). In order to maintain pricing parity, we chose Creative Labs's budget-priced GigaWorks T20 speakers to represent cone-speaker technology.

BY MICHAEL **BROWN**

CONE SPEAKERS
Creative Labs GigaWorks T20
$100, www.creative.com

round 1

LOW-END FREQUENCY RESPONSE

There's no contest here: A cone speaker acts like a piston, moving a diaphragm in and out to displace the air at its surface. The larger the cone, the more air the speaker can displace. That's just the ticket for producing the long sound waves needed to produce gut-punching bass.

As cool as they might look, flat-panel transducers are physically incapable of generating frequencies below about 150Hz. The only NXT-based speaker systems we've auditioned that are worth listening to are ones that mate NXT panels with a hefty subwoofer that uses—you guessed it—a large cone speaker to produce bass.

WINNER: CONE SPEAKERS

round 2

HIGH-END FREQUENCY RESPONSE

High frequencies are characterized by short waves, so flat-panel speakers are on a much more equal footing on this score because they don't need to displace as much air to create these sounds. Listening to the title track of Jesse Sykes's *Oh, My Girl,* we were pleased with the Brook-

reproducing cymbal strikes and the upper spectrum of the acoustic guitar.

But when we played the same track on Creative's speakers, we realized how

frequencies were on the NXTs. Sykes's vocals sounded much lusher on the cone speakers, which we attribute to the presence of both a tweeter and a midrange driver.

WINNER: CONE SPEAKERS

round 3

STEREO SWEET SPOT

Because of their concave nature, cone speakers can't help but project sound. This renders them highly directional, so they tend to create a relatively small sweet spot where audio from the left and right channels is perfectly balanced. Small cone speakers, like the Creative GigaWorks T20s used for this test, are best suited for near-field listening environments. Move more than a few feet away, and their capacity for producing a stereo image collapses.

Since the entire surface area of a flat-panel speaker produces sound, these speakers are nearly omnidirectional and are, therefore, capable of creating a very large stereo sweet spot. The very low frequencies a subwoofer produces are also nearly nondirectional, which is why a subwoofer can be placed nearly anywhere in the listening environment.

WINNER: FLAT-PANEL SPEAKERS

round 4

VERSATILITY

Cone speakers require boxlike enclosures to do their thing, there's no getting around it. The larger and more capable the speaker, the larger the enclosure it needs. Aesthetically speaking, big boxes and svelte LCD and plasma monitors—or paper-thin projector screens, if that's your thing—just don't get along.

Flat-panel speakers, particularly those based on NXT's patented technology, can fit just about anywhere and be integrated into an astounding variety of materials, including fabric. Amina Technologies manufactures speakers that can be not only mounted inside a wall, but also completely hidden behind wallpaper or even a skim coat of plaster without affecting their acoustic performance. Tannoy uses the same technology to build speakers that disappear into suspended-tile ceilings.

WINNER: FLAT-PANEL SPEAKERS

FLAT-PANEL SPEAKERS
Brookstone Wafer-Thin CD/MP3 Shelf System
$200, www.brookstone.com

And the Winner Is...

Yeah, these two technologies split the wins in our four criteria, but we value audio fidelity much more than we appreciate the ability to camouflage boxes, so we're giving the nod to cone speakers. No matter how good a flat-panel speaker may be—and there are a few very high-end configurations out there—they will always depend on a cone-based subwoofer to reproduce anything close to the entire sonic spectrum. Meanwhile, the cone speakers in the very inexpensive GigaWorks T20 speakers proved capable of delivering respectable bass even without a sub.

Although we've panned a couple of absolutely dreadful implementations of NXT's technology—namely, Logitech's lame mm28 portable speakers and Kensington's absurdly expensive SX 2000 iPod speaker system—we heaped praise on Tascam's VL-S21 budget studio monitors. But when we want an audio system that can serve up anything from the splendor of a Mahler symphony to the delicious splat of a headshot in Rainbow Six, we'll rely on our old-fashioned cone speakers. MPC

Our consumer advocate investigates...

✓Monarch Gets Cocooned ✓GigaHacked ✓Clerks Gone Wild ✓Lenovo Battery Recall

Louey, ***watchdog of the month***

TIGER DIRECT BUYS MONARCH?

The Dog heard from several sources that Tiger Direct had bought defunct PC maker Monarch Computer Systems, but alas, it's not true. Despite rumors that the buyout was a done deal, Tiger Direct officials tell the Dog there was no purchase. However, the company has hired a number of former Monarch employees and opened a satellite office in Georgia.

Tiger Direct said it was still sorting out the details and couldn't elaborate on how the former Monarch employees would fit into its empire, but the Dog speculates Tiger Direct wanted some of Monarch's PC and sales expertise.

The Dog chronicled Monarch's fall from grace in our March issue; problems included sheriff's deputies and county tax officials seizing the company's property until it could come up with $44,000 to cover back taxes. (The company also owes Future Network, the publisher of *Maximum PC*, about $61,000 in unpaid bills.)

Those who had pinned their hopes on Tiger offering tech support for Monarch PCs or filling orders that were never shipped should probably get used to the fact that help is most likely not on the way. When a kaput company gets bought out, it's standard operating procedure for the purchase to exclude taking on the obligations and debts of the company. And that's when a company is purchased; Tiger says it didn't buy Monarch.

There is some relief for Monarch PC owners. Washington-based Puget Custom Computers has said it will perform warranty work for Monarch customers for free. "Puget is offering to do all warranty-related work on Monarch computers, with no labor charges. Former Monarch customers will still be responsible for any shipping or component costs needed for repairs," according to a statement on Puget's website, www.pugetsystems.com.

Some GameStop clerks apparently don't understand, that, umm, Halo 2: Vista means Vista only.

MAYBE OUR GAMESTOP CLERKS ARE SMARTER THAN YOURS

I have been anxiously awaiting Halo 2 for a long time but decided to wait to buy it until I get a new PC with Windows Vista. While planning for a Halo: Combat Evolved PC LAN party, I called GameStop to reserve five copies of Halo: CE. Before I hung up, the clerk asked if I wanted to reserve Halo 2 for PC, and I replied that I was waiting to get a machine with Vista. The worker at GameStop said Halo 2 for the PC would work on ***both*** *Windows XP and Vista. I was perplexed by this comment since both Microsoft's and GameStop's websites state that Halo 2 for the PC works only on Vista! I called another GameStop in my area to see if the previous store was wrong and was told the same thing: Halo 2 for the PC will work on both XP and Vista. Is GameStop crazy or are Microsoft and GameStop suffering from amnesia?*

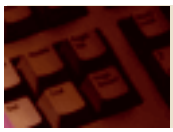
— Dennis Wittekind

Maybe your clerks should stop jawing with the Chewlie's Gum rep and start reading more because they were both flat-out wrong. Perhaps the clerks didn't get the message from Halo 2's official title: Halo 2: Vista. And from what the Dog can ascertain, there's no change of heart. H2V will remain a Vista-only title on the PC.

To see if the clerks in California are as wrong as the two you spoke with, the Dog called five EB Games and GameStop stores. Three clerks said no way, Kurt—it ain't called Halo 2: Vista because it's a catchy name. Another clerk said "it might," while the final clerk said she didn't know but pointed out that the $5 deposit can be refunded if you don't purchase the game. Another tip from the clerk if you're short on cash—you can tell your "mom" that the store will let you trade in used DVDs for the deposit as well. So that's where the Dog's Lassie box set went! Woof.

GIGASLOW

I bought GigaFast networking equipment from Micro Center with the promise of a $30 rebate, but before the check got cut, I received an email from OnRebate.com stating, "We regret to inform you that the above rebate claim has not been funded by



Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic the Dog on them by writing **watchdog@maximumpc.com.** The Dog promises to answer as many letters as possible, but only has four paws to work with.

the sponsoring manufacturer, GigaFast, Inc., and therefore cannot be paid. GigaFast, Inc. contracted with OnRebate.com, Inc. to have OnRebate.com, Inc. process GigaFast, Inc.–sponsored rebates, but, in violation of the terms of this contract, GigaFast, Inc. has not funded disbursements for several months and has not responded to our many funding requests or other attempts to reach them. As a result, rebate disbursements to customers who purchased GigaFast, Inc. products have not been made. At this point, your rebate claim is being canceled, but your rebate details will be kept on file in the event that you are able to contact GigaFast, Inc. and get them to fund your claim."

I then called GigaFast and tried to reach a human, but instead I received a message essentially saying that "we're gone, but thank you for your money." I just wanted to give you guys a heads up over at Maximum PC, so you could spread the word.

— Brandon Etto

Sounds ugly. After hearing from Brandon, the Dog tried to phone GigaFast to get the scoop and also heard the rather juvenile message saying that the company was a goner and "thanks for the money." All it needed was a "peace out" to complete its lack of professionalism. To add to the mystery, the Los Angeles area Better Business Bureau gave the City of Industry networking company a solid F, with 70 complaints filed against it; 26 of those complaints went unanswered.

An email to an officer of the company listed on GigaFast's website bounced higher than a Superball. The Dog was about to pronounce this corporate cadaver ready to be tagged and bagged when he stumbled upon a phone number for GigaFast's spokeswoman, Theresa Wang. Surprisingly, Wang answered the Dog's call. Wang told the Dog the problem with the phone message stemmed from someone maliciously hacking the company's phone system. She said she wasn't sure how long the message had been there, but the company removed it as soon as it was discovered. The problems with the rebate company, Wang stated, stemmed from an issue the accounting department had, and she did not have all the pertinent details, but obviously, the relationship has ended and OnRebate.com emailed GigaFast's customers. That, in turn, Wang claimed, led to the grade of F from the BBB when a horde of customers filed complaints. The good news, Wang told the Dog, is that GigaFast is alive and well, there has been no change of status, and the company is trying to handle rebates as quickly as possible. Those waiting for rebate checks are encouraged to contact the company at rebate@gigafast.com.

While the Dog isn't comfortable ruling GigaFast a safe buy just yet, Brandon pinged the Dog to say that he was contacted by the company and is now waiting for a check to be cut directly from GigaFast. Still, if OnRebate.com's claim of GigaFast not paying its bills is true, you might want to think hard before reaching for the company's equipment. MPC

Recall **Alert**

Lenovo has recalled 205,000 notebook batteries that may overheat if they take a sharp whack.

Lenovo is recalling another 205,000 notebook PC batteries that may overheat and cause fire damage. Sanyo built the batteries, and about 100,000 were sold in the United States. The company said it has received four reports of batteries overheating and damaging notebooks, with one person suffering minor eye irritation as a result. The batteries don't overheat by themselves but may pose a danger if struck on the corner—something quite possible in a notebook PC. The extended-life batteries were used in the ThinkPad R60, R60e, T60, T60p, Z60m, Z61e, Z61m, and Z61p. The recalled nine-cell batteries have the following part number, FRU P/N 92P1131, which can be found on the battery's label.

If your battery has this part number, you are advised to stop using it and contact Lenovo for a free replacement. Consumers may call the company at 800-426-7378 or visit www.lenovo.com/batteryprogram. The website has a utility that will gauge your battery's safety. You may also manually enter your battery's bar code number if you are unsure whether your battery is part of the recall.

CC
ALL

COPY & CONVERT YOUR MOVIES AND MUSIC

TAKE CONTROL OF YOUR MOVIES AND MUSIC!

We'll show you how to make archival copies of your CDs, DVDs, iTunes Store purchases, and even HD DVD and Blu-ray discs!

BY THE MAXIMUM PC STAFF

The fundamental problem with modern copy protection is simple: Content producers treat their paying customers like criminals as opposed to people who are buying their content through legitimate sources. If you purchase a song from iTunes, you can play it on only five machines and burn it to CD just a handful of times. If your buddy downloads that song from a file-sharing client (or rips a store-bought CD, for that matter), he can play it on all of his PCs and burn it to as many mix discs as he'd like. It's just not right.

Lest you get the wrong idea, *Maximum PC* remains committed to paying artists for their work. But we also believe that when you purchase media content—whether it's a song, a movie, or a TV show—you should have complete freedom to play it on all of your devices as many times as you'd like.

This is a great power, and with it comes great responsibility. It's within your right to copy media for your own use; however, as soon as you give that content to a friend, you're breaking the law and violating the artist's copyright. If artists stop getting paid for their work, they'll stop making it, and we'll miss out on the music and movies we love.

There's another twist to the whole issue. While the "fair use" doctrine (arguably) gives you the right to copy media for your own use, the Digital Millennium Copyright Act (DMCA) makes it illegal to break encryption on copyrighted works—regardless of your reasons for doing so. By decrypting a copyrighted DVD for backup, you're breaking the law. Of course, the only way anyone will know you've done something wrong is if you start distributing the decrypted files—thus violating copyright—and we know you'd never do that. That's why we can, in all good conscience, show you exactly how to take control of all your media.

COPY & CONVERT
ALL YOUR MOVIES AND MUSIC

ARCHIVE YOUR CD LIBRARY

Forget MP3! We're making bit-by-bit perfect copies of our music collection using a lossless codec

WHAT YOU'LL NEED

Your audio CD collection

Exact Audio Copy (**free, www.exactaudiocopy.de**)

FLAC (**free, http://flac.sourceforge.net**)

AccurateRip (**free, accuraterip.com**)

Audio CDs are susceptible to damage and aging, so it's a good idea to make archival copies of your collection. We'll show you how, using the lossless compression algorithm FLAC (Free Lossless Audio Codec).

A lossless encoder compresses digital audio files with absolutely no compromise in fidelity compared to the original. The only drawbacks are large file sizes (though they're much smaller than WAV files) and scarce support among portable players. On the other hand, FLAC enjoys wide support among audio-streaming boxes.

STEP 1: INSTALL EAC AND FLAC

Exact Audio Copy (EAC) will detect and attempt to auto-configure any optical drives on your system during setup. Check those you wish to use and click Next. Use the "I prefer to have accurate results" option and click Next.

Choose the option "I don't trust these values…," drop a clean audio CD in the drive, and click Next. It's crucial that the drive you rip from has an "accurate stream," meaning it does not produce "jitter" (if the drive can't accurately seek a specific sector on the disc, ripped tracks will have audible distortion).

Remove the checkmark next to "Install and configure LAME…" and click Next. Enter an email address and click Next. Choose the Expert option at the final prompt and click Finish. Exit EAC.

Install FLAC, ignoring the Winamp and Nero messages. Leave checkmarks next to all the default options and click Install.

STEP 2: INSTALL ACCURATERIP

Install AccurateRip and then copy the file **accuraterip.dll** from **C:\program files\illustrate\dbpoweramp** to **C:\program files\exact audio copy**. Put a CD in the drive and relaunch EAC. Click the Configure button and then click OK. Select all tracks and click EAC's Action menu. Choose Copy Selected Tracks from the drop-down menu; use the uncompressed option.

AccurateRip will compare your results to a database of rips by others and report a confidence level. "Confidence 30," for example, means your rip is identical to that of 30 other people, so there's a high probability it's accurate. Click OK.

STEP 3: CONFIGURE EAC

Click the EAC menu and choose EAC Options. Click the General tab. Leave these options at their defaults but place a checkmark next to "On unknown CDs" and select the option "Automatically access online freedb database." Click the Tools tab and place checkmarks next to everything *except* "Create '.m3u' playlist…," "Do not open external…," and "Activate beginner mode."

Click the Filename tab and enter the values **%A\%C\%N - %T** into Naming Scheme to create a nested directory structure that follows the Artist Name\Album Title\Track Number - Track Title scheme. Check "Use various artist naming scheme" and enter the values **Various Artists\%C\%N - %A %T** so compilation albums are stored in a "Various Artists" folder broken up by album. Click OK.

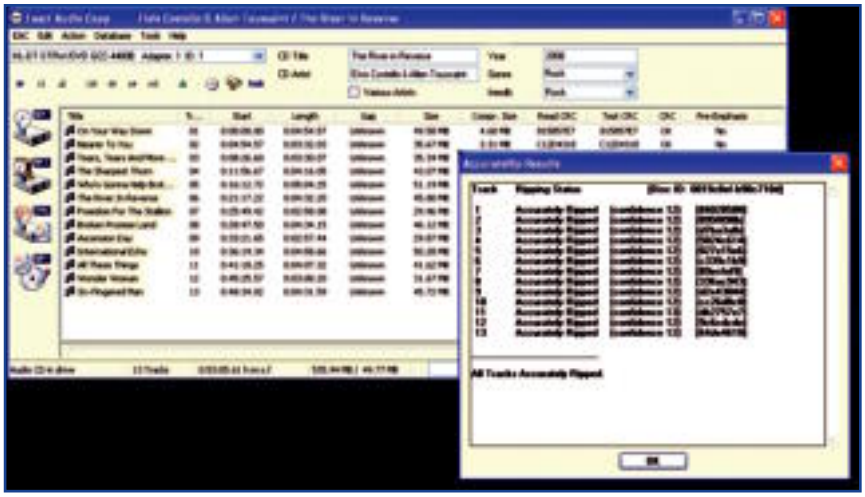
Click the EAC menu again and choose Drive Options and Extraction Method. Make sure Secure Mode is selected, with a checkmark next to "Drive has Accurate Stream feature." Click the Drive tab and check "Spin up drive before extraction." Leave everything else at default and click OK.

Click the EAC menu once more, choose Compression Options and External Compression. Check "Use external program for compression." In the drop-down menu "Parameter passing scheme," select "User Defined Encoder." Type **.flac** in the "Use file extension" box.

Click Browse, locate the FLAC executable (flac.exe), select it, and click OK. Enter these characters into "Additional command line options": **-6 -V -T "artist=%a" -T "title=%t" -T "album=%g" -T "date=%y" -T "tracknumber=%n" -T "genre=%m" -T comment="%e" -T "comment=EAC (Secure Mode)" %s**. Bitrate doesn't matter, but check "Delete WAV after compression" and "Check for external compression return code."

STEP 4: COMMENCE ARCHIVING

Place the audio CD you wish to archive in the drive. Click the Action menu and choose "Test and Copy Selected Tracks" using the Compressed option this time. This will perform a cyclical redundancy check (CRC) to verify the integrity of your rip. It's another paranoid step, but we think it's warranted when producing critical backups. An OK will appear in EAC's CRC column if the rip was executed successfully. Repeat until you've backed up your entire library.

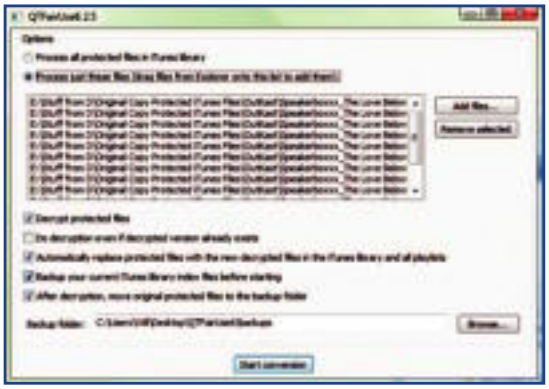


Using AccurateRip and EAC's Test & Copy option will provide an added measure of assurance that your rips are precise and worthy of your archive.

COPY & CONVERT ALL YOUR MOVIES AND MUSIC

DECRYPT ITUNES FILES

Even Steve Jobs hates DRM, so in his honor, we'll show you how to decrypt tracks you buy from his store



QTFairUse6 will let you decrypt your iTunes Music Store purchases.

WHAT YOU'LL NEED

iTunes 7.02 or earlier (**www.itunes.com or http://www.oldapps.com/itunes.htm**)

QTFairUse6 ver. 2.5 (**free, find it on Google**)

You've bought a ton of music from the iTunes Store, but when you bought a non-Apple player, you realized you had a problem—your new player can't play any of the tracks you purchased through iTunes. Never fear, it's easy enough to decrypt your music files to play on any device—you just need the right tools.

It's always been possible to burn your tracks to audio CD and then rerip them, but it's a pretty serious pain in the ass. After you rip the tracks to MP3, you need to type in all the ID3 information for every track. Also, recompressing the tracks introduces errors, which diminishes the quality of your audio. Like we said, it's a real hassle.

QTFairUse sidesteps the FairPlay encryption in iTunes files by pulling the unencrypted AAC-formatted track from memory before it's decompressed. Then it tacks the song's artist, title, and album info onto the new file and replaces the old protected file in iTunes with your new protectionless file.

To make it work, all you need to do is install QTFairUse, start iTunes, then run QTFairUse6.exe. You have two options: You can either have it go through your iTunes database and automatically convert all your protected files or change them one at a time. If you have trouble getting the app to decrypt your files, try starting iTunes before you load the application.

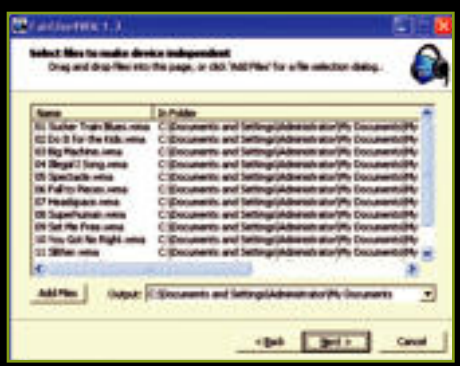
You'll also need to use a specific version of iTunes; version 2.5 of QTFairUse6 won't work with versions of iTunes newer than 7.02.

It's a good idea to flip the toggle in QTFairUse6 that backs up your original encrypted files. In the past, Apple has used different tricks to disable playback of decrypted songs. You may need to re-decrypt the original files at some point in the future.

You should also know that there's currently no way to decrypt video files purchased from iTunes. Of course, the easy way to avoid all these problems is to simply not purchase music or video from online stores that use digital rights management. That means you're stuck buying DVDs, CDs, or unencrypted MP3s from a store such as eMusic.

DECRYPT WMA FILES

Microsoft's content protection can be defeated, but it's significantly more difficult to do



Assuming you have the right version of Windows Media Player, you can decrypt files encoded using Plays4Sure.

WHAT YOU'LL NEED

FairUse4WM (**free, find it on Google**)

Windows Media Player 9 or 10

Decrypting Windows Media protection can be significantly more difficult than decrypting FairPlay, but there are tools that will do the job. However, decrypting WMA files isn't as cut and dried, legally speaking, as decrypting iTunes Store files. Many music providers who use Plays4Sure encryption actually just rent music—instead of paying per track, as you do with iTunes, you pay a flat fee every month and your music is accessible for only as long as you pay. While it's acceptable to decrypt music you own, decrypting music you rent so that you can keep it after you cancel your subscription is stealing.

That said, it's fairly easy to decrypt Windows Media files if you're not running WMP11; all you need to do is download FairUse4WM and run it on the files you want to decrypt. The trick is that you can't be running the final version of Windows Media Player 11—it includes technology that bypasses decryption software. If you've already installed WMP11, it's tough to get rid of. You'll either have to nuke your Windows install and start from scratch or install Windows in a virtual machine with the proper version of WMP. You'll also need to have the proper keys to play the files stored on your machines—Windows Media Player downloads these automatically the first time you play the file.

This works only on songs that have been encrypted using Plays4Sure; the tracks from the Zune Marketplace use a new type of DRM, which hasn't been cracked yet.

COPY & CONVERT
ALL YOUR MOVIES AND MUSIC

RIP AND ENCODE YOUR DVDs

It's easy to make archival-quality copies of your movies and then save them in open formats that will work with any device!

WHAT YOU'LL NEED

AutoGK (**free, www.autogk.me.uk**)
DVD Decrypter (**free, find it on Google**)
RipIt4Me (**free, www.ripit4me.org**)
FixVTS (**free, http://download.videohelp.com/FixVTS/**)
AC3Filter (**free, http://AC3Filter.sourceforge.net**)

Ripping DVDs is much more complex than ripping audio CDs. The format includes built-in copy protection, which makes ripping discs more hit or miss, especially since the movie studios are rolling out newer, trickier forms of protection all the time. The sad truth is that, frequently, getting a good rip from your DVD requires a lot of trial and error.

In the past, we've recommended an expensive cocktail of utilities to rip your commercial DVDs; however, that's not strictly necessary anymore. We've had great success using free and open-source software to rip our favorite movies, even the troublesome discs that caused problems in the past.

There are two basic steps to the process, and we'll show you how to do both! First, you'll need to copy the contents of the disc to your hard drive, then you'll encode the data using a more efficient codec than is actually used on commercial DVDs. The result is a movie that looks and sounds great and takes up a fraction of the space the DVD would require on your drive. Once you've ripped your DVDs, it's a cinch to store them on a file server, convert them to portable-player-friendly formats, and even stream them across your network. We'll even show you how to fix the two most common ripping problems.

STEP 1a

RIP MOVIE DVDs

The easiest way to rip a movie DVD—we'll talk about TV show DVDs in a moment—is to use DVD Decrypter at its default settings. Insert your disc, open DVD Decrypter, make sure the disc is set to File mode (press F), and rip the disc.

Occasionally, there are problems ripping in File mode. Many newer discs include copy protection that confuses DVD Decrypter, and you may end up with hitches in the movie or badly out-of-sync audio. Fixing the audio sync is simple (we'll talk about that on the next page); hitches in the movie are usually caused by multiple viewing angles in the DVD. To fix this problem, you'll need to rerip the disc with multi-angle processing enabled. Go to Tools, Settings, File Mode, and check Multi Angle Processing. You'll want to use Angle 1. When that's done, you can skip ahead to Step 2 on the next page.

If your problems persist—and, unfortunately, you won't know this until after you've already encoded the movie—the only solution is to rerip and re-encode the entire picture using RipIt4Me, using the instructions in step 1c.

STEP 1b

RIP TV SHOW DVDs

Ripping TV shows is tricky; there are usually three to six episodes on one disc that are split into different titles or chapters. The first thing you'll do is switch DVD Decrypter to IFO mode by pressing I. Then you'll need to tweak the IFO mode settings by going to Tools, Settings IFO Mode. Make sure all the boxes in the Settings section are checked and File Splitting is set to None.

Next, you'll want to individually rip each episode in its own IFO. In the Input window, expand the different VTS_XX entries until you find PGC entries that are the proper length for your TV shows (usually 23 minutes for half-hour programs and 46 minutes for hour-long shows). Select one and then rip it to the destination of your choice. Repeat for each episode, saving each rip in a separate folder on your hard drive.

Occasionally, you'll find a TV show DVD that stores all the episodes in one large title. In that case, it's best to rip it just like you would a movie and then split the files up later using our process explained in the VirtualDub sidebar on the next page.

STEP 1c

RIP PROBLEM DVDs

We're going to assume that you ripped and encoded your disc, but the final product has a problem. It's usually easy to fix audio-sync errors, but any video hitches, out of sync sections, or other more complex errors will probably require a rerip. It's time to use RipIt4Me.

The good news is that RipIt4Me is super easy to install and use. Download the app and install it, along with FixVTS. Then fire it up and walk through the Wizard mode. Follow all the instructions up to the step involving DVD Shrink. Since we're encoding using the Xvid codec instead of just reburning on DVD, you can safely skip this step—we'll use AutoGK to handle the encode for us in Step 2.

There are commercial alternatives that are much better supported than the freeware apps. AnyDVD (**$80, www.slysoft.com**) makes DVD ripping a simple drag 'n' drop affair and allows you to use commercial DVD ripping software that doesn't support decryption, i.e. Nero Recode. And because AnyDVD is a for-profit product, the folks at Slysoft are very good about updating the software to defeat any emergent types of content protection found on new DVDs.

STEP 2

ENCODE USING AUTOGK

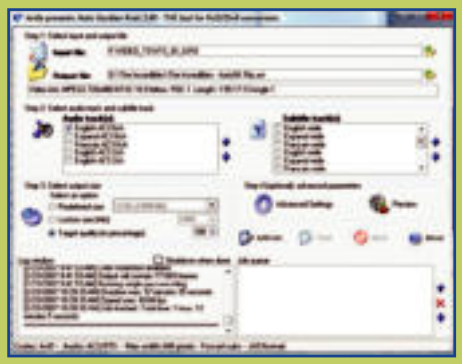
If you finished any version of Step 1, you should have a folder with decrypted IFO and VOB files. The IFO files serve as the table of contents for your DVDs, while the VOBs contain the actual MPEG-2 encoded video from the DVDs. The first thing you need to do is point AutoGK to the proper IFO file—there may be several in your rip directory. It's a little tricky to tell which is the proper PGC, but you should be able to figure it out using the run time for each section. It will be the same length as the movie or TV show you want to encode.

Next, you'll want to select the audio track to use for your finished movie, the quality setting, and subtitles (if any) you want to use. Generally, the first track is the proper one to use—it's usually Dolby Digital 5.1 in English. Unless you want a specific subtitle, it's usually best to skip them. As for quality, we usually encode using the highest quality settings, then transcode down for portable hardware that requires lower resolutions or smaller files. To maximize the quality, set the Target Quality to 100%. Finally, you'll want to tweak the advanced options. Click the Advanced Settings button and adjust the Output resolution to maximum width, check "Display only forced subtitles," and switch "Output audio type" to Original (if you want to preserve the DVD's 5.1 sound). Forcing subtitles will enable their display in movies that use them for only certain scenes. If you don't enable this option, then you won't see any subtitles when Jabba tells Han he's bantha fodder in *Return of the Jedi,* for example.

There are a host of advanced options hidden in the Ctrl+F9 menu.

It's also worth mentioning that if you rip the original audio track in Dolby Digital 5.1, you'll need to install AC3Filter to hear the audio on your PC. However, many handheld and streaming devices support Dolby Digital natively and will reproduce full 5.1 sound when you play videos.

Finally, you may want to check the hidden options. Press Ctrl+F9 from the main AutoGK interface. The most obvious option you may need is cartoon rendering. Enable cartoon rendering only for hand-drawn animation, such as *The Simpsons* or *Family Guy*. If you enable it for Pixar-style 3D animation, you will not get good results.



AutoGK handles all the dirty work of your DVD encode and produces good-looking, small encoded movies.

The only thing left to do is tell AutoGK where to save your file; press Add Job, and then start the queue processing. One of the best features of AutoGK is that it allows batch processing. If you rip multiple DVDs to your drive, you can actually set AutoGK to encode them one after the other, with no input required from you. We like to queue up four or five movies every night, and then wake up to multiple finished encodes!

RESYNC AUDIO

There are a couple ways audio can get out of sync when you're ripping a movie. Either it stays consistently out of sync through the entire film or it gets gradually worse as the picture goes on. If it stays the same, it's easily fixed using VirtualDub (which should have been installed with AutoGK). If the audio gets progressively worse, you've usually got to rerip the disc, taking care to remove multiple angles from the video stream (see Step 1).

To resync fixable audio, first open your movie in VirtualDub. Then determine how off your audio track is and whether the audio is playing ahead of the video or vice versa. Go to the Streams menu and click "Stream list." There should be only one stream, so right-click it and select Interleaving. You'll want to adjust the Audio Skew Correction, which is measured in milliseconds (remember, 1,000ms = 1 second). You should use a positive skew if the audio plays too early and a negative skew if it plays too late. You can adjust this number and then play the output to see how you did (you'll need to use the third button from the left on the control panel to preview the output).

Continue making adjustments until your audio syncs with your video and then save the video. You'll want to make sure you enable "Direct stream copy" in the save dialog, or it will take ages to re-encode the video.

SPLIT FILES USING VIRTUALDUB

Sometimes you end up with one large file either on purpose or by mistake. Splitting files is simple, but you'll need to use VirtualDub again. Open the video you want to split, move to the first frame of the section you want to split off, and press the Home key. Then move to the last frame and press the End key. This will select everything between the beginning and end of your section. Then go to the File menu and select Save As. Again, ensure that "Direct stream copy" is selected, name your file, and press Save. This will create a new video that contains just your selected section of the movie or TV programming.

COPY & CONVERT ALL YOUR MOVIES AND MUSIC

RIP HD DVD AND BLU-RAY DISCS

There's one big reason to decrypt and copy high-definition discs right now—HDCP. If your rig isn't able to play HDCP-encumbered movies, this procedure will let you copy the discs to your drive whether you have HDCP hardware or not!

HD DVD

You need three things to back up your HD DVD discs: an HD DVD drive, BackupHDDVD 1.0, and the title key for the disc you want to rip. You'll have to search Google for BackupHDDVD_1.0.rar, as download sites for the app remain fairly transient. The app includes title keys for many releases, but you may need to download more from either **www.aacskeys.com** or **www.hdkeys.com**.

For our tests, we used Microsoft's Xbox 360 HD DVD drive, which works with any Windows PC. You'll need to have a ton of hard drive space if you want to rip multiple HD DVDs—each rip takes about 20GB of space. To start the rip, open BackupHDDVD, point it to your HD DVD drive, and tell it where to save the ripped disc. Then press the Start Backup button and come back in about an hour.

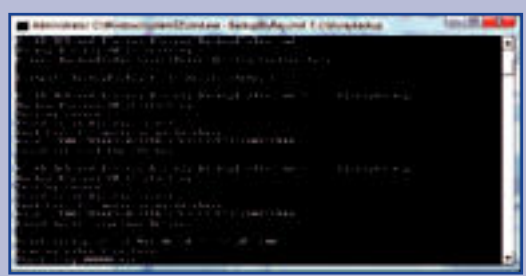
The bad news is that the tools to extract video and audio and then recompress them using a more efficient codec aren't available yet for HD DVD content. So for now, you'll have to leave the entire 20GB monster rips on your drive. However, this will let you play high-definition content on a display or videocard that lacks HDCP implementation, which is reason enough to endure the hassle.

Copying HD DVDs is very easy with this handy graphical utility.

BLU-RAY

Unfortunately, as we went to press, the tools for ripping Blu-ray discs were substantially less developed. Instead of a fast GUI, you'll need to use a slower Java application, which also necessitates installing Java on your rig.

Search Google for BackupBlurayv021.zip and extract it to a directory on your hard drive—we used C:\backupbluray\. Unlike the HD DVD ripper, the first version of the Blu-ray backup app doesn't include any title keys, so you'll have to find them on the Internet at **www.aacskeys.com** or on message boards. You'll need to open the CPSKey.cfg file in the run subdirectory and manually input the keys you find on the Internet for your discs. Then open a command line and browse to the app's directory using the command **cd \backupbluray\run**. Type **Backupbluray.cmd x: c:\blurayrips**, where **x:** is your Blu-ray drive's letter and **c:\blurayrips** is a directory you created that has enough free space. Press Enter, and your rip will be underway.



Decrypting Blu-ray discs is a little trickier than decrypting HD DVD—there's no pretty GUI!

BLAME IT ON HDCP

Once you've decrypted your HD DVD or Blu-ray discs, you'll be able to watch them on any display—even one that doesn't support HDCP—using your normal HD DVD or Blu-ray software. Just select the Browse to File option in your player software and watch away.

Why is all this hoop-jumping necessary? Because high-def movie playback on PCs is badly broken. Dig this: If you play an HD DVD or Blu-ray movie on an analog display, it just works. Most players don't automatically downsample the quality, and you see the movie in its full high-definition glory. However, if you use a digital connection and your monitor or videocard doesn't support HDCP (or even if they do, in some cases—check out In the Lab on page 56), your picture will either be downsampled or disabled entirely. That's just not right.

ANYDVD TO THE RESCUE

Lucky for us, there is an easier way to bypass HDCP

We've long been fans of AnyDVD's smooth decryption. The app sits in your taskbar and automatically decrypts discs on the fly as you drop them into your drive. Now, the makers of AnyDVD have brought the exact same functionality to HD DVD and Blu-ray discs.

For a mere $80, AnyDVD HD (www.slysoft.com) will let you play your HD DVD or Blu-ray discs on any monitor. The drag 'n' drop decryption doesn't work quite as well as it does with old-fashioned DVDs, but it's fine for playback, and it's getting better every week.

CAT AND MOUSE COPY PROTECTION

Now that AACS encryption has been circumvented, it's only a matter of time before Hollywood makes its next move

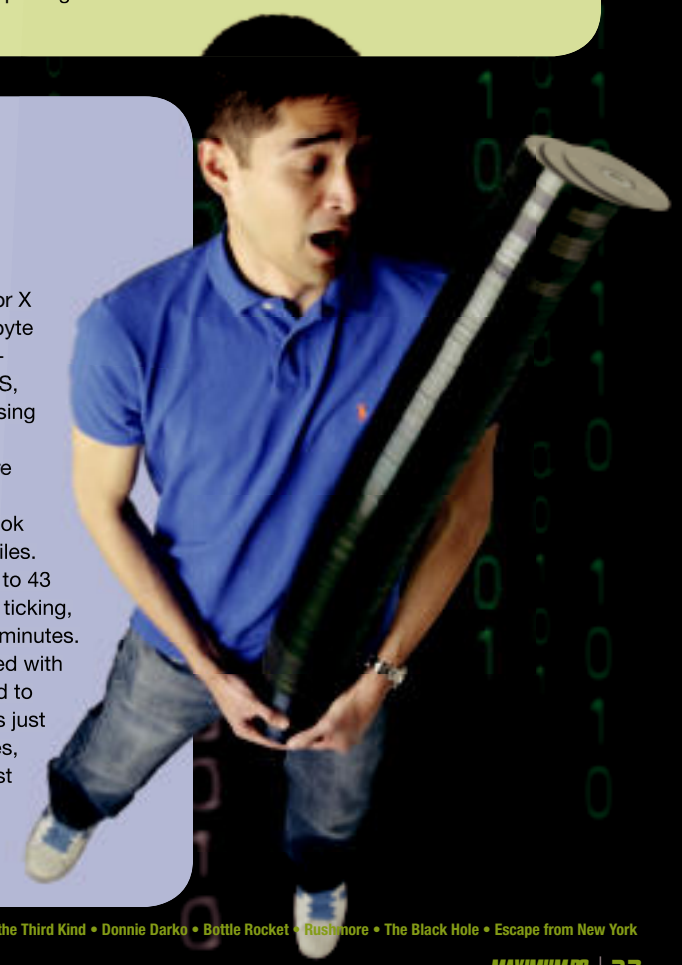
One of the biggest changes to the HD DVD and Blu-ray formats is the inclusion of copy-protection measures that can adapt as exploits and cracks are found. Since the current decryption schemes for both formats are based on exploits from a few software players, it's only a matter of time before the studios release movies that won't play on that software or that patch the software breaches. These changes could obviously affect the fates of BackupHDDVD and AnyDVD. In six months, next-gen discs could be impervious to decryption again, so keep that in mind before you spend money on hardware or software to play these formats. If you want to keep up with day-to-day happenings in the HD scene, visit **www.boingboing.net** and **www.doom9.org.** Boing Boing delivers news on major cracks and the political fallout, while the folks at doom9 focus on the action end of the news—if you get our drift. If you choose to participate in the doom9 community, make sure you read and follow its rules!

HARDWARE MATTERS

Know what to upgrade to end slow encodes

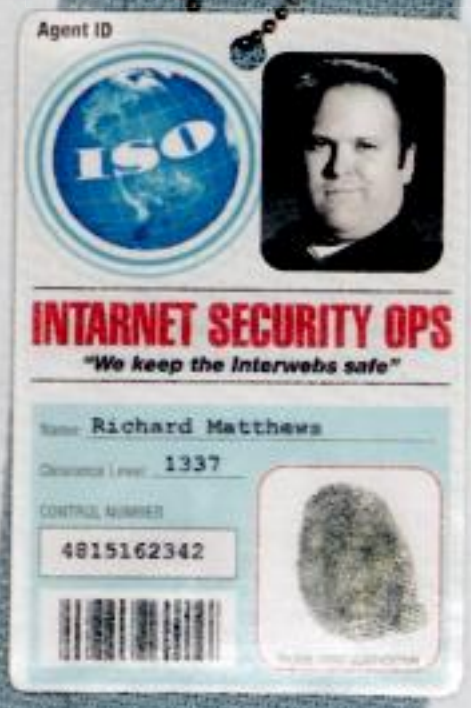
Take that you damned videocard! The CPU is still king when it comes to encoding—which is the number-one time-suck in most media-archiving chores. We tested how long it would take AutoGK to encode a set of ripped VOB files from a local hard disk. For our test, we used an EVGA 680i SLI motherboard equipped with a quad-core 2.66GHz Intel Core 2 Extreme QX6700 processor, 2GB of RAM, Windows XP, and a GeForce 8800 GTX card. (In our experience, the hard disk is not a factor in encoding—we found virtually no difference when reading, encoding, and writing the files to a 400GB WD SATA drive versus faster hard-drive arrays.)

Our tests proved that when it comes to encoding, the CPU makes all the difference. The VOB files were read from a separate WD 10,000rpm Raptor X and written to a 4GB Gigabyte i-RAM drive. Disabling individual cores within the BIOS, we ran the same encode using four cores, two cores, and one core. The verdict? More cores equals better performance. With one core, it took 71 minutes to encode the files. With two cores, it dropped to 43 minutes, and with all cores ticking, the encode dropped to 30 minutes. And the Xvid codec included with AutoGK isn't fully optimized to run quad cores yet—it uses just three. As the codec matures, the quad-core times will just get better. MPC



MAXIMUM PC'S SEVENTH ANNUAL

Geek Quiz



Test your computing smarts to see if you deserve a place among the geek elite

Throughout human history there has prospered a species we now know as geeks—folks with an all-consuming passion in one particular field. Often, their passion comes at the expense of social acceptance, intimate relationships, and attention to basic personal hygiene. But no longer must the geek lifestyle be a thing of shame. Today, we at Maximum PC take great pride in our geekiness. We wear our obsessive preoccupation with all things computing—our geekdom, if you will—like a shiny badge. As should you. That is, if you can prove your worth by acing our test of tests, the exam to end all others: the *Maximum PC* Geek Quiz!

1 What is this?

a. A serial port header
b. A USB header
c. A TPM header
d. A Live Drive header

2 Videocards labeled "HDCP Ready" are guaranteed to play copy-protected movies stored on HD DVD and Blu-ray discs.

a. True
b. False

3 A joystick with a throttle and analog hat switch has ___ control axes.

a. 2
b. 3
c. 4
d. 5

4 What spectrum of light does the laser in a laser mouse use?

a. Infrared
b. Ultraviolet
c. X-ray
d. Green

5 Name one of the ingredients in Intel's new high-k dielectric gates:

a. Titanium
b. Hafnium
c. Adamantium
d. Blueberries

6 A 30-inch 2560x1600 LCD can display an entire ____ at a 1:1 ratio.

a. 4MP image
b. 6MP image
c. 8MP image
d. 10MP image

7 The first RTS game for the PC debuted in 1992 and was called:

a. Command & Conquer
b. Dune II
c. Warcraft
d. Stonkers

8 Quad-core Core 2 processors communicate with each other across:

a. A high-speed interchip connection
b. A 16x HyperTransport link
c. The front-side bus
d. A pair of cups and a string

PHOTOGRAPHY BY MARK MADEO

GEEKS THROUGH HISTORY

Sideshow Geek

circa early 20th century

Carny folk. They're shifty and slovenly and smell of hay. But without these narsty, nomadic carnival clans, we wouldn't have the Sideshow Geek, a performer (of sorts) who decapitated poultry for the amusement of others. Make no mistake, the Sideshow Geek isn't considered proto-geek in the *Maximum PC*–approved geek phylogeny—the real *primoris smartius* doesn't hit the scene until the mid-20th century. But our bilious butcher is certainly the progenitor of the word geek itself.

Bit the heads off chickens, did the Sideshow Geek. Did he eat said chicken heads? Unclear. But his carnivorous campaigns under the carnival canvas just plain grossed everyone out, and thus negative connotations began swirling over the Sideshow Geek's head, like so many pestilent flies. Then, in 1953, wrestler Fred Blassie coined the term "pencil-neck geek" to describe a weakling worthy of wedgies, wet willies, and whatever horseplay a '50s-era bully might find possible with a set of old-timey suspenders. And so, the geek-as-nerd-boy definition was born.

Geek grub, premastication.

Answers → 1-b, 2-b, 3-b, 4-a, 5-b ,6-a, 7-b, 8-c

Geek Quiz

9 **Who has NOT starred in a film as a computer hacker?**
a. Gene Hackman
b. John Travolta
c. Robert Redford
d. Matthew Broderick

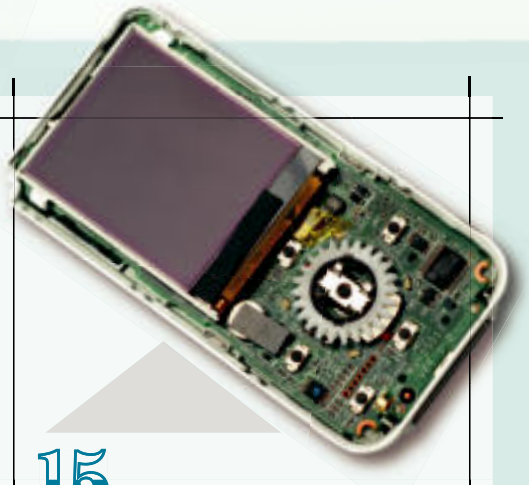
10 **The designation "Tip, Ring, Sleeve" refers to a type of:**
a. Geek formalwear
b. Stereo audio connector
c. Monaural audio connector
d. Either B or C

11 **Using Windows Media Extender, you can watch this file format on your supported devices:**
a. MPEG-2
b. AVI
c. MOV
d. DivX

12 **In 8-bit-per-channel color, there is a palette of ____ possible colors.**
a. 65,536
b. 3,538,944
c. 12,816,094
d. 16,777,216

13 **I am a version of Vista:**
a. Vista Basic Premium
b. Vista Home Basic
c. Vista Premium
d. Vista Basic Enterprise

14 **The fastest external peripheral connection currently available is:**
a. USB 2.0
b. FireWire 400
c. eSATA
d. FireWire 800



15 **What company designed this board?**
a. SanDisk
b. Samsung
c. Toshiba
d. MSI

16 **Which CPU features the largest cache?**
a. Pentium Extreme Edition 840 (Smithfield core)
b. Athlon 64 FX-51 (Sledgehammer core)
c. K6-III (Sharptooth core)
d. Pentium 4 Extreme Edition (Gallatin core)

17 **Noise reduction applied to a JPEG will NOT:**
a. Make the file size larger
b. Reduce the amount of grain or electronic noise you see
c. Make the image appear softer
d. Possibly induce halos

18 **Which supercomputer is the fastest?**
a. Sandia Cray Red Storm, Sandia National Labs
b. BGW: eServer Blue Gene Solution, IBM Thomas J. Watson Center
c. IBM BlueGene/L, Lawrence Livermore Labs
d. ASC Purple: eServer pSeries p5, Lawrence Livermore Labs

GEEKS THROUGH HISTORY

Crypto Geek circa early 1940s

Dutch was in the foxhole, wading through his own shit and waiting for death from German 88s. Cookie was in the mess tent, peeling rotten potatoes and guessing what the hell the "chips" were in the latest shipment of chipped beef. And then there was Leonard. He was 30 miles behind the line, cocooned in a warm flannel blanket and sleeping off the top-shelf brandy that he and his cryptographer buddies had sipped so leisurely the night before.

The Crypto Geek was the rock star of World War II soldiery. With his mad math and engineering skills, he deciphered enemy code and could alter the course of an entire military campaign in a single day's work. And so he was pampered and coddled and even assigned his own aide-de-camp to push up his geek glasses whenever they slipped down his geek nose. The Crypto Geek was the original code monkey and was the first to make slide-rule ownership part and parcel of the American dream.

Much respect.

Alan Turing, father of WWII cryptography and modern comp sci.

Answers → 9-b, 10-d, 11-a, 12-d, 13-b, 14-c, 15-d, 16-d, 17-a, 18-c

Geek Quiz

NASA Geek

circa mid-to-late 1960s

It's unfortunate that the NASA Geek wore the same uniform as today's lacquer-haired McDonald's manager—the same $10 short-sleeve shirt, the same Sta-Prest trousers, the same inoffensive, monochromatic, "I am in strict accordance with section 78-D of the dress code" tie. But let's not hold the NASA Geek's wardrobe against him. The 1960s space race was all-consuming, so our best and brightest couldn't focus any attention on fashion, let alone laundry.

Like an army of intelligent hymenoptera, NASA Geeks toiled in the underground catacombs of Cape Canaveral, creating a brighter future in real time.

Cheap ties: NASA's full of them.

Besides unlocking the secrets of space flight, they worked on truly important projects like the development of Tang and pens that write upside-down. They also read a lot and learned the meaning of crazy words like hymenoptera. So all hail the NASA Geek. Without him there would be no tranya or dilithium crystals. *There would be no Jar-Jar Binks.*

19 The first strategy game to deliver free downloadable units was:

a. C&C Red Alert
b. Warcraft II
c. Total Annihilation
d. M.A.X.

20 Which of the following is NOT a voice over IP protocol?

a. SIP
b. AIM
c. Skype
d. Vonage

21 A microtransaction is:

a. The communication between circuits on a 45nm CPU
b. A single step in the GeForce 8800's unified shader process
c. A small transaction used when purchasing music or game add-ons online
d. None of the above

22 What's the maximum size of a video you can post on YouTube?

a. 10MB
b. 30MB
c. 100MB
d. 300MB

23 Which of these home-automation protocols is based on an IEEE standard?

a. Insteon
b. Zigbee
c. X10
d. None of the above

24 What's the name of the encryption scheme used on HD DVDs?

a. AACS
b. AAACS
c. ACCS
d. ACSS

25 Which Nvidia chipset features a real-time hardware Dolby Digital encoder?

a. nForce 680i SLI
b. nForce 590 SLI
c. nForce3
d. nForce2

26 Multisampling, supersampling, and stochastic sampling are examples of:

a. Grazing techniques college students use to supplement their grocery budgets
b. Techniques hip-hop artists use to mix snippets of classic songs into new recordings
c. Antialiasing techniques used in computer graphics
d. Techniques magazine editors use to secure new products for review

27 Which Intel chipset does not officially support 1066MHz front-side bus processors?

a. 925X
b. 955X
c. P965
d. 975X

28 This is a:

a. SLI bridge
b. CrossFire bridge
c. Bridge to Terabithia
d. HyperTransport link

29 Which of these raw materials do high-end speakers typically have in common?

a. Titanium
b. MDF
c. Mylar
d. Polypropylene

Answers → 19-c, 20-d, 21-c, 22-c, 23-b, 24-a, 25-d, 26-c, 27-a, 28-b, 29-b

Geek Quiz

30 **How many GB per layer does a Blu-ray disc hold?**
a. 10
b. 15
c. 25
d. 50

31 **You can't watch HD movies on your old DVI monitor because of:**
a. HDPC
b. HCDP
c. HDCP
d. ORLY

32 **I am not a standard case-fan size:**
a. 8cm
b. 9.2cm
c. 12cm
d. 14.5cm

33 **The first first-person shooter to support 3D acceleration was:**
a. Quake II
b. Duke Nukem 3D
c. Hexen II
d. Quake

34 **UAC stands for:**
a. User Annoyance Companion
b. User Account Control
c. Using Any Controller
d. Underneath Any Comptroller

35 **A videocard based on Nvidia's 8800 GTS GPU has a ____ frame buffer.**
a. 768MB
b. 640MB
c. 320MB
d. Either B or C

36 **When you see this in World of Warcraft, it indicates:**
a. The start point for a new quest
b. That you've completed a quest
c. The NPC has something for sale that you can use
d. The NPC would like to purchase something from your inventory

37 **Which topic has Senior Editor Gordon Mah Ung NOT ranted about in the *Maximum PC* podcast?**
a. Adobe Acrobat update reminders
b. Bagel-top eaters
c. Showers that drain poorly
d. That damn deli guy

38 **OpenAL is:**
a. The open-source language used in 4GL code
b. Web 2.0 lingo for a new, lightweight forum-to-forum mod, lightheartedly called Open Aluminum
c. An open-source API for audio being pushed by Creative Labs
d. Al Gore's new open-source programming language designed for power-efficient computing

39 **How many CPUs does AMD's Quad FX platform contain?**
a. 2
b. 4
c. 6
d. 8

GEEKS THROUGH HISTORY

DEVO Geek 1975-1990

Akron, Ohio. Circa mid-70s. Rowdy stadium rock ruled the airwaves, and Hessians roamed the streets in El Caminos, looking for wimps to soak with water cannons. Every third male under the age of 25 was a weed dealer. Civilization was moving backwards.

And thus was born DEVO, children of *de-evo*lution. With skin so pale as to be semi-translucent, they were frightening to look at—sort of like white asparagus. But when they emerged on the music scene, spore-like, in 1975, they legitimized a new way of cool. Short hair, quiet humility, and an appreciation for the faux sciences became a tenable lifestyle path for any schoolboy who threw like a girl.

With their groundbreaking synth sounds and wireless mics, DEVO helped pioneer the marriage of music and technology, a modern geek mainstay. They even wore the disposable hazmat suits that we geeks lust over when perusing Labsafety.com. But most importantly, DEVO helped give birth to "new wave," which begat "alternative," which ultimately killed stadium rock. Big, tough frat-boy geeks began bullying their wimpier geek brethren, and so through fully realized de-evolution, universal order was restored.

This was a really cool look at one tim

DEVO PHOTOGRAPH BY ©ALLEN TANNENBAUM

Answers → 30-c, 31-c, 32-d, 33-d, 34-b, 35-d, 36-a, 37-d, 38-c, 39-a

Geek Quiz

GEEKS THROUGH HISTORY

Maximum PC Geek 1995-present

If you answered 48 or more questions correctly on the 2007 Geek Quiz, tear off a little piece of your tin-foil hat and affix it to the open space here. Now look directly into the tin-foil mirror. The sight you see is Maximum PC Geek—the pinnacle of all geekdom. You are Übergeek. Geek Incarnate. 100 Percent Pure Geek Concentrate. Grand Marshal of the Tenth Annual Geek Day Parade. Archgeek Nerdhelm von Geekenhoff of the United Republic of Geekovia. You're a 10th Degree Black Belt in the Ancient Fighting Art of Geeku-ryu. You've got your geek on, and, baby, it fits you well.

You chew PCB for breakfast. You breed DDR2-800 modules in a hutch in the backyard. You've got Intel's Rio Rancho fab on speed dial. You've coded an OpenGL driver using nothing but Megadeth lyrics—and benchmarks *improved*. Your garage door opener runs Windows Sideshow. You're so highly evolved, your larynx is nothing but a vestigial remnant, and you communicate entirely through telepathic IM.

Hats off, Maximum PC Geek. Ultimate geekness achieved have you.

Apply tin foil here with an appropriate adhesive (e.g., Arctic Silver, Gorilla Glue, hard-drive rail clips, or highly concentrated Mountain Dew distillate).

40 Which processor has the highest clock speed?
a. Core 2 Duo T7600
b. Athlon 64 FX-57
c. Pentium Extreme Edition 840
d. Celeron D 356

41 Which chipset supports dual x16 PCI-E for dual graphics cards?
a. Nvidia nForce4 SLI
b. Intel 975X
c. AMD 480X CrossFire
d. Nvidia nForce 590 SLI

42 What CPU was this socket designed for?
a. Athlon 64 FX-74
b. Pentium Extreme Edition 955
c. Pentium Core 2 Quad E6600
d. Opteron 265

43 What has the highest theoretical throughput?
a. SATA 3
b. FireWire 1600
c. x4 PCI Express
d. PCI-X

44 A TEC is:
a. A thermoelectric cooler
b. A Peltier cooler
c. A nitrogen-based cooler
d. A and B

45 Which is a possible replacement for today's LCD screen technology?
a. Carbon nanotubes
b. OLED
c. High dynamic range LCD
d. All of the above

46 What's the code-name for Intel's 45nm CPU?
a. Penryn
b. Wookiee Feet
c. Barcelona
d. Mendocino

47 Torrenza is:
a. A crème brûlée-like dessert served alongside a tart aperitif in Tuscany, Italy
b. Intel's PCI Express add-on for the upcoming Bearlake-Z chipset
c. IBM's new 45nm process technology that uses high-k plus metal gates
d. AMD's co-processor concept for the Quad FX and Opteron

48 What's the name of the media that carries Blu-ray on one side and HD DVD on the other?
a. HD-ray
b. DualDisc
c. DualDisc II
d. TotalHD

49 What type of networking technology does the Sonos Digital Music System use?
a. A wireless mesh network
b. 802.11n
c. A proprietary variant of 802.11g
d. A and C

50 Which hard drive spec is most relevant to users concerned only with copying files >3GB?
a. Burst speed
b. Cache speed
c. Average read speed
d. Random access speed

MPC

Answers → 40-d, 41-d, 42-a, 43-d, 44-d, 45-d, 46-a, 47-d, 48-d, 49-d, 50-c

The BIG

PICTURE

BY KATHERINE STEVENSON

Today's massive desktop LCDs look stunning, but will their hidden secrets leave buyers with big remorse?

It used to be that a 24-inch LCD was the height of desktop decadence for an enthusiast. With a 1920x1200 resolution, the 24s delivered maximum screen space and performance. Well, 24 is king no more. In fact, an onslaught of larger screens has rendered 24 inches downright quaint.

New to the scene are 26/27-inch panels, with several vendors adding the category to their product lines. It makes perfect sense, really. These screens offer the same 1920x1200 resolution and 16:10 aspect ratio as a 24-inch LCD, just spread out over a greater expanse. It's easier on the eyes when you're doing desktop work, and movies and games appear that much grander.

Also of interest are the latest 30-inch desktop panels. It's not a new category, but it's become more attractive now that most high-end consumer graphics cards offer the dual-link interface and horsepower needed to run these 2560x1600-resolution screens. That pixel density across a 30-inch expanse will give you almost more screen real estate than you'll know what to do with, but the question remains: Is this a power user's paradise or a niche product?

You owe it to yourself to understand today's large-screen market before you succumb to the urge to buy a big, pretty screen.

PHOTOGRAPHY BY MARK MADEO

BEFORE YOU BUY

Size matters, but it's not the only important spec. Here's what you should consider when shopping for a large desktop LCD

NATIVE RESOLUTION

Every LCD sports a fixed number of pixels arrayed in a grid. The native resolution is the width of the display in pixels (for example, 1920) by the height in pixels (1200). Running your display at its native resolution will deliver the optimal picture. While it's possible to run an LCD at a lower non-native resolution, the image will be rescaled, and the display will double up some pixels to fill in the missing places, which can degrade image quality. This is of particular concern to gamers, who often run games at low resolutions to boost frame rates. Also consider that a higher resolution makes everything look smaller onscreen but gives you a proportionally larger desktop.

ASPECT RATIO

A display's aspect ratio is its screen width divided by its height. Standard desktop monitors have a 4:3 aspect ratio, while widescreen models are typically 16:9 or 16:10. If content, such as a game, insists on a 4:3 ratio, it will stretch to fill the entire screen, making everything look fatter than it should. This is becoming less of a problem every day, as most games support at least one widescreen mode that isn't distorted. Make sure that's true of your favorite titles.

INTERFACE

We insist on a digital video interface (DVI), since this allows the videocard to send pixel info to the screen in an unconverted digital format—converting an analog signal to a digital signal introduces errors. Until recently, most consumer graphics boards supported only single-link DVI, but that interface doesn't deliver enough bandwidth for resolutions greater than 1920x1200. If you're in the market for an ultra-high-res 30-inch screen, make sure your videocard offers support for dual-link DVI, which essentially doubles the bandwidth of a single link.

PIXEL RESPONSE TIME

This is the time (measured in milliseconds) it takes for a pixel to change phase. A slow response time can induce artifacts in rapidly changing content, such as a game. Unfortunately, LCD vendors have different ways of measuring and reporting this number, so it's not a reliable means of comparison. You're better off judging a panel's pixel-response performance based on a hands-on evaluation or the testimony of experts *(ahem)*.

HDCP

A big, widescreen LCD simply begs to be used for viewing high-def movies, but this won't be possible if your display lacks HDCP support—the content protection required to play commercial HD DVD or Blu-ray discs.

CONTROLS

The degree to which you can adjust an LCD's picture via the onscreen display (OSD) varies among monitors; in some cases, you have fewer options with the DVI because the manufacturer skimped in this area. At a bare minimum, you should have control over color, brightness, and contrast.

ERGONOMICS

Obviously, the more you can adjust your screen's height, tilt, and orientation to fit your needs, the better.

BIG NOW BEGINS AT 26 INCHES

It's as if the 24-inch screens got caught juicing—same 1920x1200 resolution, same wide aspect ratio, just pumped up to fill a larger space. Here's what we think of three 26/27-inch models

ACER AL2616WD

OK, so the 26-inch measurement includes the bezel (a common convention in LCD marketing)—still, we're talking 25.5 viewable inches of screen. That's 10.2 percent more area than you get with a 24-inch screen. But while Acer goes big on the panel, it spares all extra amenities (unless you count the craperific built-in speaker, which we don't). The AL2616Wd's bronze-and-black plastic cabinet looks a little low rent and lacks any adjustability, save front-to-back tilt. And we don't put much stock in the thin, flimsy DVI cable that shipped with the unit. But even if we were to buy a replacement cable, Acer's AL2616Wd would cost far less than competing panels. And truth be told, it's a decent performer for the price.

Onscreen display (OSD) buttons beneath the front bezel are easy to navigate and include user-controlled color sliders, but we found little need to futz with the screen's settings. In DisplayMate (www.displaymate.com), the AL2616Wd reproduced a rich, uniform dark screen, although some backlight was evident around the perimeter, and the panel

The grandeur of the Acer AL2616Wd's nice, big screen is hurt by its low-rent housing.

adeptly handled grayscales of up to 256 steps. But we did notice anomalies in text reproduction. While black text on a white background was perfectly legible at 9 points, black-on-gray and white-on-black at the same point size lacked sharpness and was bothersome to read. This was not the case with the other two monitors reviewed here.

All other content, including digital pictures, games, and movies—both standard and HD format (even with HDCP)—looked perfectly acceptable on the AL2616Wd when viewed straight on. Darker content lost contrast and detail when viewed off axis. This LCD is solid, not superb.

VERDICT: 7

$760, www.acer.com/us

NEC MULTISYNC LCD2690WUXI

Its name might be three times the length of the Acer model's, but NEC's LCD2690 (our nickname for it) sports the same 25.5 viewable inches of screen. Like Acer's display, it features an austere design, but it's much better executed. The cabinet is basic black—unadorned and unobtrusive, but by no means unaccommodating. The LCD2690 features a telescoping neck for height adjustment, plus swivel, tilt, and rotate functions; it also offers an array of OSD options, including individual color sliders for yellow, cyan, and magenta in addition to the standard red, green, and blue. An advanced option menu offers further tweaks. And when you're using the OSD, tiny icons appear onscreen near the buttons, so you can navigate the menu in the dark. It's neat, but the menu is still a bitch to figure out.

The LCD2690 boasts a "92 percent color gamut"—a phrase we're seeing used more and more to describe LCDs. The measure refers to the range of colors the screen can display, and the increase is primarily attributed to the use of an improved backlight, commonly known as wide cold-cathode fluorescent lighting, or W-CCFL. If a standard LCD is known to display 72 percent of the color gamut as specified by the National Television Systems Committee (NTSC), then the increased breadth of the LCD2690's gamut should be noticeable. In our tests, however, it wasn't. The NEC's colors looked vibrant and lifelike, but no more so than what we saw on Acer's model, which makes no such claims of its color gamut.

Still, there was much to like about the LCD2690. Games and movies (including those with HDCP) looked large and in charge on the screen and in both scenarios the picture was notably strong off axis. The monitor also held up to DisplayMate's strict standards, except in one area: In tests that reveal the uniformity of an LCD's backlight, the LCD2690's appeared a bit blotchy and uneven. With most content you wouldn't notice it, but when the screen is predominantly filled with a solid, low-intensity color, it is apparent, and even distracting. A small but annoying chink in this pricey screen's armor.

NEC's LCD2690: Now with more color spectrum?

VERDICT: 9

$1,700, www.necdisplay.com

Dell's 2707WFP stomps the competition with a bolder, ballsier look and feel.

DELL 2707WFP

Dell also asks for a steep fee to step up from 24 inches, but it sweetens the deal in a couple key areas. The "27" in this product's name refers strictly to screen size. And those 27 viewable inches of liquid-crystal real estate amount to a 13.6 percent area advantage over the other two models here. It's tough to argue with that! DVI, VGA, S-video, composite, and component options (along with picture-in-picture, picture-by-picture, and HDCP support) let you share the display with various input devices, e.g., a TV, console, or cable box—which makes a lot of sense on a screen this size. Indeed, the 2707WFP is clearly poised as a product for digital enthusiasts.

Its aesthetics echo that sentiment. In a departure from Dell's typically staid desktop line, the 2707WFP rocks brushed aluminum with shiny silver accents and a reflective black base. It sports a more elaborate button scheme on its front bezel and a revamped OSD with a healthy array of options. And the screen physically adjusts for height, tilt, and swivel preferences.

Like NEC's entrant, the 2707WFP proclaims a 92 percent color gamut, but, again, the range seemed no more expansive than Acer's. More to Dell's favor is the relative size of its screen compared with its competitors'. Digital pictures, games, and movies that looked nice on the other two LCDs appeared that much more outstanding on the 2707WFP, even off axis. This screen's only fault was a hint of color tracking errors in DisplayMate's grayscales of 64 steps or more—which we couldn't detect in any of our real-world content. It's a matter we can forgive in an otherwise damn-fine monitor.

VERDICT: 9

$1,400, www.dell.com

MAXIMUM PC KICKASS

	ACER AL2616WD	NEC MULTISYNC LCD2690WUXI	DELL 2707WFP
VIEWABLE SCREEN (INCHES)	25.5	25.5	27
INTERFACE	DVI, VGA, Audio (for built-in speaker)	DVI, VGA	DVI, VGA, S-Video, Composite, Component, 9-in-2 media reader, 4 USB 2.0

DO 30-INCH SCREENS OFFER MORE TO LOVE?

Now that more consumer graphics cards sport dual-link DVI, larger screens boasting 2560x1600 ultrahigh resolutions are a tempting prospect for power users

DELL ULTRASHARP 3007WFP-HC

Dell's update to its original 30-inch model is distinguished by the "HC" at the end of its name. The letters stand for "high color" and denote the screen's ability to display—can you guess it?—92 percent of the NTSC color gamut.

Interestingly, while we saw no difference between Dell's 2707WFP and its "72-percent color" competitor, we did see a difference between Dell's 30-inch HC and its predecessor, the plain-old 3007WFP. Primary colors in particular were noticeably more intense on the new HC model. For instance, when viewing a high-res photograph of a partially shaded garden on both screens, the colors of the foliage popped from the shadows on the HC while appearing muted on the 3007WFP. And in a whole series of digital photos, illustrations, videos, and games the 3007WFP-HC had a more vivid, richly colored picture.

Sure, it's possible some of the HC's color depth can be attributed to its backlight, but we suspect that at least some is the result of an overly warm screen tone, which in itself can add intensity to hues. The warmth is especially apparent in skin tones, which appear uniformly flushed on the 3007WFP-HC, and in reds, which can look unnaturally bright—a blood-soaked hanky in *Terminator 3*, for example, looked like it was dipped in berry juice. Whatever the cause, the 3007WFP-HC's extreme colorfulness works well in some instances—such as gaming—creating a bold, brilliant picture, but at other times makes the screen image look overly saturated and artificial.

Dell's 3007WFP-HC is the company's second attempt at a 30-inch monitor, but we're still not sold.

The HC's gamut certainly wasn't all that great in DisplayMate's grayscales. When tasked with 65 or more steps of transition, white was indistinguishable from very light grays, as were dark grays from black.

Regarding the 30-inch category as a whole, don't expect any onscreen display controls for tweaking anything other than brightness. These screens lack an internal scaler, the necessary component for making any adjustment to a screen's picture, be it resolution, color, gamma, etc. The cost of the silicon needed to perform these operations across this many pixels is simply too high to be practical. Thus, any scaling must happen via the videocard, a less-than-optimal solution. It's an interesting paradox that these very large screens, which are a natural fit for content creators, offer compromised control over picture quality.

Here's another interesting paradox: These ultra-high-res screens are hobbled by HD content. Today's graphics cards carry HDCP over only a single-link interface, and without a scaler, the monitor's only single-link res is half its maximum: 1280x800. Not even 1920x1080! That's ridiculous. (See In the Lab on page 56 for more details).

Gaming performance is acceptable, without any obvious ghosting, but face it, unless you're running dual 8800s, your frame rate will suffer at native resolution.

Yes, the Dell 3007WFP-HC has sheer size and a sharp picture going for it, and an adjustable stand, a media reader, and four USB ports are nice, but we'd just as soon wait for the technology to be refined.

VERDICT: 7

$1,700, www.dell.com

HP LP3065

At the risk of seeming lazy, we'll sum up HP's LP3065 by saying it's pretty much like Dell's 3007WFP-HC. In fact, we'd wager that the two panels come from the same manufacturer, so similar are their qualities. It's not such a far-fetched assumption, as there are really only a handful of LCD-panel makers, and that number surely diminishes at this screen size. Like Dell's 30-inch HC, HP's screen possesses a 92-percent-color-gamut-producing W-CCFL backlight.

HP's LP3065 is Dell's brother from another mother.

Regardless, the similarities are many. A warm overall screen tone? Check. Dazzling colors that sometimes seem overkill? Check. Blown-out light and dark grays? Checkity check. To see how the latter issue manifests in regular use, we looked at high-res digital images with lots of subtle shading and detail. And with both the Dell and HP models we saw, for instance, that a rendered piece of parchment paper lacked texture and the light pencil smudges on a scanned architectural draft weren't visible. Such subtleties *were* apparent on Samsung's 30-inch 305T, but more on that later.

Like Dell's 3007WFP-HC, the LP3065 sports four USB 2.0 ports, support for HDCP, and height, tilt, and swivel adjustability. But HP offers three DVI inputs (dual-link, of course) to Dell's one, so you can use this display with multiple computers. On the other hand, HP's LP3065 lacks any media reader. And this is what it really comes down to for the consumer deciding between the Dell and HP models. Those niggling differences aside, you're looking at two very similar, very large, very vibrant LCDs—that are by no means perfect.

VERDICT: 7

$1,700, www.hp.com

SAMSUNG SYNCMASTER 305T

If you don't mind the lack of controls, subpar HDCP support, and frame-rate hit in games that are inherent to a 2560x1600-res display, we'd recommend that you opt for Samsung's SyncMaster 305T.

The 305T boasts a decidedly cooler tone. It's not overly blue, but it is slightly off center of neutral. Next to the warm-toned displays, it even appeared a bit muted at times, but overall its color was much more lifelike in all kinds of content. On the 305T, skin tones looked natural, not ruddy, and colors seemed accurately balanced. Details such as fine lines and light freckles, which eluded the other two screens, were clearly visible. Sure enough, the 305T was far more adept at reproducing gray-scales in DisplayMate than its competitors. Every step of the scales was accounted for and transitions were smooth and flawless.

Gaming was good for the most part, though in areas of high contrast there was a little more evidence of smearing than on the other two panels. But, again, none of these panels is ideal for games, particularly if you lack ultimate graphics power. Either you will forsake some image quality, via interpolation or disabled visual effects, in order to increase your frame rate, or you will experience some lag if the monitor is set at its native ultrahigh res. There are serious gamers on our staff who think the majesty of these big screens makes up for the compromises, others don't.

If your appetite for pixels outweighs practical matters, look no further than Samsung's 305T.

The 305T comes with a single DVI port, a telescoping neck, a lazy-Susan-like stand, four built-in USB ports, and HDCP. All told, it's the best of the unusual 30-inch breed.

	DELL 3007WFP-HC	HP LP3065	Samsung 305T
VIEWABLE SCREEN (INCHES)	30	30	30
INTERFACE	DVI, 4 USB 2.0, 9-in-2 media reader	3 DVI, 4 USB 2.0	DVI, 4 USB 2.0

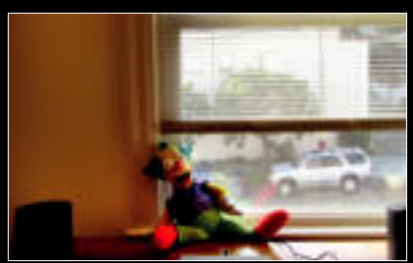
VERDICT: 8

$1,800, www.samsung.com

STEALTH YOUR MONITOR

Your monitor may be mondo, but it needn't impede your view! Create wallpaper that seamlessly blends in with your background in three easy steps!

WHAT YOU'LL NEED → A digital camera → A tripod → Photo-editing software

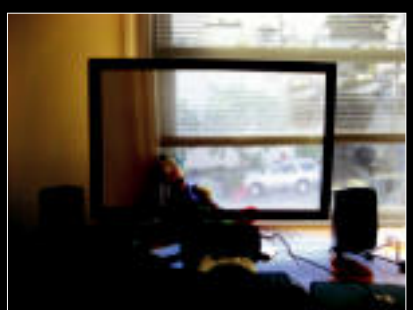


STEP 1: CLEAR YOUR DESK

The first thing you'll need to do is clean off your desk to take a picture of whatever's behind your monitor. You'll have to move your display, but before you do that, make sure there are several points of reference in your work area, so you'll easily be able to tell where you need to crop the screen.

STEP 2: TAKE THE SHOT

Now, set up your camera on a tripod. The camera should be exactly at the same position your head is at when you're sitting at your desk. Use your reference points to help fill as much of the frame as possible with pixels you'll be able to use. It's best to shout without a flash, so you should try several different exposures for optimal results. It's also funny to put something unexpected behind the display—like our Evil Krusty doll.



STEP 3: CROP THE SHOT

This is the tricky part. First, replace your monitor on your desk, then crop the shot to match up with the background behind your display. It will take a few tries, so be sure to save the uncropped original somewhere safe. That's all there is to it!

MPC

Shoot Video and Post It on YouTube

Take videos with your phone, point-and-shoot camera, or camcorder—then share them with the world in six easy steps!

TIME 00:30 HOURS:MINUTES

In the olden days, if you wanted to broadcast your video to the outside world, you needed a million dollars worth of equipment, a team of technicians, and an FCC license. Not anymore. In fact, you've probably got everything you need in your backpack. Have a still camera with video capability, a PC, and an Internet connection? You're in. We'll show you how you can use these tools to get nearly instant international broadcasting capability on YouTube. You'll be surprised to see how quickly you can shoot a video, import it into Windows Movie Maker (which is included with Windows), edit that footage, and then post it on YouTube for all to see.

BY CHARLIE **WHITE**

MATERIALS

- **A CAMERA THAT CAN SHOOT VIDEO**
- **WINDOWS**
- **AN INTERNET CONNECTION**

1 Shoot Video with Your Camera or Cell Phone

Many still cameras on the market today can shoot full-fledged 640x480 video at 30fps, which happens to be roughly the same frame size and rate that's been broadcast far and wide for the past half-century. Turns out that's also more than enough resolution for YouTube. Sure, you can use a DV camcorder, but for shooting and editing on the fly, we're for solid-state, guerrilla, off-the-cuff content creation using a still camera's video function. We film with a Canon SD500, but any still camera or phone that can also shoot video will do the trick. Assume you're out and about with your cell phone in your pocket and a laptop in your backpack. Suddenly something fascinating happens—something everyone needs to see. Hey, you have everything you need to send those shots to the world!

Shooting with a still camera can be more challenging than using a full-size camcorder. The main problem is keeping the camera steady enough to capture watchable video. You may not think you're shaking very much as you're shooting, but even a little bit of rocking and rolling is enough to make your viewers hurl. If you have a tripod handy, use it. If not, hold the camera as still as possible by bracing yourself against something sturdy.

All the equipment you need to shoot YouTube-quality video.

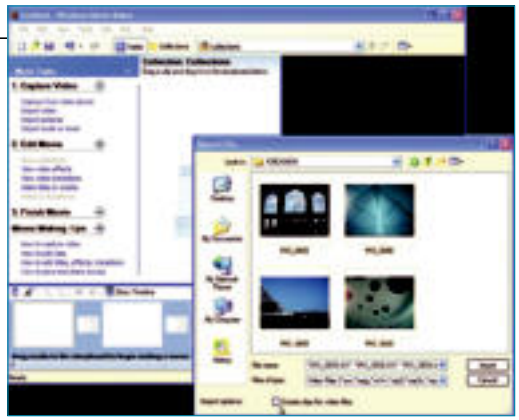
Try not to shoot scenes that have a lot of detail, such as crowds or trees with lots of leaves, because they are harder to compress and end up looking blocky and pixelated. If you're shooting someone talking to the camera, place that person in front of a plain background. Many times, these factors are out of your control, but if you have the liberty of choosing your background, keep it as simple as possible for better-quality compression. Also, choose your shots carefully—you'll have only about eight minutes of shooting time with a 1GB SD card on a typical 640x480 camera, so make every shot count. By making good choices when you're shooting, you'll save yourself a ton of time when you're editing on your PC.

2 Import the Video to Movie Maker

To move video files from a camera to a PC, we prefer plugging the camera's flash memory card into a card reader, but you can also connect your camera to your notebook via USB. Our tiny 12-inch laptop has an SD card slot, and that's what we use to import our quick 'n' dirty videos.

Next, launch Windows Movie Maker and click File. You'll have a choice of either capturing from a video device or importing video. Windows Movie Maker version 6, which is included with Vista, can import more file types than earlier versions of the software (Vista Home Premium and Ultimate also include support for HD resolutions). If your video format isn't supported, your camera manufacturer probably provides a utility to do a quick conversion.

Moving the video onto your PC from a flash card is a snap. Just click Import Video, find your clips on the flash card, control-click the ones you'd like to use, and then select Import. Be sure to uncheck the box at the bottom labeled "Create clips for video files," unless you want Movie Maker to cut your footage into nonsensical bits and pieces for you.



Be sure to uncheck "Create clips for video files" before you import your shot into Movie Maker.

3 Edit the Video

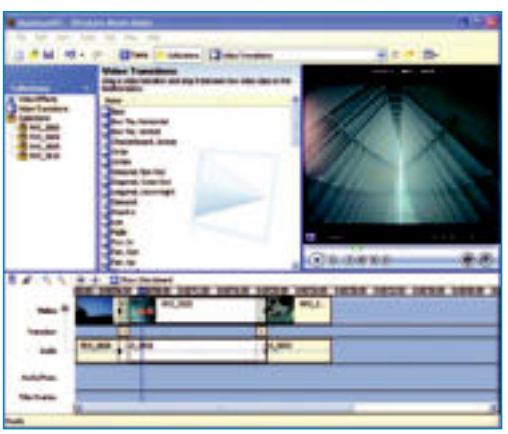
Now that you've imported your shots, it's time to blend them together into a smooth sequence, gussying them up before the big show. Or, for the quickest transition from lens to international debut, you can skip editing altogether and put your clip right onto YouTube in its raw state. To do that, skip to step 5.

Click the Collections button at the top of the screen to see the clips you just imported. The default Windows Movie Maker mode for editing is Storyboard view, in which you can line up your clips at the bottom of the screen. Drag your first clip into the first square in Storyboard view, and now it's ready for editing. Drag a second clip onto the second large square next to it, and hey, you're editing. You can add a transition between those shots by clicking Video Transitions in the Collections window and then dragging and dropping your chosen transition into the small square between two shots. If you don't put any transitions in those little squares between clips, that's OK, too—you'll have a simple cut between one shot and the next.

Next, go into Timeline view, in which you'll have better control over your clips. Just above the clip you just dragged onto the Storyboard view, click the icon labeled Show Timeline. You'll see the Timeline view, which looks similar to what even the most expensive editing software packages on the planet produce. This view gives you the advantage of edge-dragging, which shows you where you're editing as you drag a clip's edge. Go ahead, try it: Drag the leading or trailing edge of one of your clips and you'll see it playing in the monitor window at the same speed you're dragging. Your cut takes place at the point where you let go, and all of the other clips will fall into place behind it (this is known as rippling). If you want even more accuracy, click the magnifying glass with the plus sign in the middle of it and you can zoom in close enough to do frame-by-frame editing.

You can also use the keyboard to split a clip in two for further tweaking. To do that, drag the current time indicator (the blue line with a small blue square on top of it) to the point where you'd like to make a cut and then either hit Control-L on the keyboard or go to the Clip menu and select Split. Go ahead, play with your clips to find the best combination of cuts. While you may have captured audio when you recorded your clip, you can also drag and drop an additional audio track into your movie—music can give your shots an added dimension. You'll quickly get the hang of lining up a series of shots. Try different combinations until they feel like they're all flowing together smoothly. Whoa, you're an editor!

Drag and drop clips onto the storyboard to get a basic lineup of your shots.



In Timeline view, fine-tune your clips by edge-dragging.

4 Add Transitions, Titles, Credits, and Effects

In Timeline view, if you want a smooth transition between one clip and the next, simply drag and drop a transition icon between two clips. You can't make any changes to these transitions, so see if one of them is right for you. And yep, you can use a variety of effects to get from one shot to another, but most of 'em will make your video look like a cheap infomercial. Stick with a fade to keep your segment within the bounds of good taste.

Let's keep it simple and place pro-style fades at the beginning and end of our movie, insert a title, and then add some effects to our shots.

For the fades, click the Tasks button at the top of the screen and then select View Video Effects from the Edit Movie menu on the left side of the screen; you'll then see an icon labeled Fade In, From Black. Drag that icon to the left edge of the first shot you placed on the timeline, and you're done. Do the same at the end of the sequence, except use Fade Out, To Black.

Next, click Make Titles or Credits and follow Movie Maker's simple prompts to Hollywood filmmaking glory—take credit for your work or add an ominous title to your mini-movie.

Want to get fancy? Add an effect to that second clip to make it look like an old movie. Just click View Video Effects, and there lies your choice of three film ages: old, older, and oldest. Drag one onto your clip and boom! The effect has been applied. Don't like it? Remove an effect by right-clicking the clip and then selecting Video Effects; you'll see the Edit or Remove Video Effects dialog box, which lets you add or subtract whatever effects you please. Tweak to taste, and then, congratulations, you're done editing. Now it's time to prep your footage for its journey to the rest of the world!

For an arty effect, choose a title animation with a layered look.

Use the Film Age, Old effect to give your movie an old-timey look.

5 Export to a YouTube-Friendly Format and Resolution

You'll want to export your movie from Movie Maker in a pixel size and frame rate YouTube will like. The optimal numbers are 320x240 at 30fps, the size of every YouTube movie after it's been converted to the site's flash video format (flv). Prepare your segment by clicking the File menu and then selecting Save Movie File. For YouTube upload, you'll want the video's quality to be as high as possible without going over the site's 100MB/10-minute limit, since that makes for better compression once it reaches YouTube to be recompressed. Select "save your movie for playback on your computer" and then enter a file name. You're then presented with a Movie Setting dialog box. Click Show More Choices to fine-tune your compression. To save in the 320x240 YouTube format, you'll need to select Other Settings and High Quality (small) from the drop-down menu. If your movie is particularly long, select Best Fit to File Size and fill in "100MB," the maximum file size for a regular YouTube account. Click Next and Movie Maker will compress your mini-movie into the perfect file size for YouTube.

Your best choice for YouTube compression in Windows Movie Maker is High Quality (small), which gives you a 320x240-pixel size, YouTube's native format.

6 Upload to YouTube

YouTube has recently improved its uploading process, making it simpler than ever. If you don't already have one, create an account and then click Upload Videos. Fill out the forms asking for the title, description, and appropriate keywords for your work and then upload that masterpiece. Don't get too antsy—it's faster than it used to be, but YouTube still needs five to 10 minutes (and sometimes even longer) to finish its compression before your crunched video shows up in your account area.

Now go to My Videos and you'll see your video, ready to be played. You get to choose whether other users are allowed to rate your video or make comments. You'll also have the option of making your video viewable only to people you authorize.

If your video is compelling, don't be surprised if over a million people watch it within a week. Stardom could be just around the corner. And it all started with that camera you didn't even know could shoot video.

Here's the finished product: Post yours and prepare to be deluged with fat Hollywood contracts.

THREE YOUTUBE ALTERNATIVES

These competitors work just like YouTube but offer some bonus features

REVVER

Revver works just like YouTube but gives you a chance to earn a few bucks from clips you've uploaded. The site pairs your video with a targeted advertisement, tracks the views of that clip, and pays you accordingly, splitting revenues with you 50/50.
http://one.revver.com/revver

HEAVY

Heavy is offering heavy competition to YouTube by including elements of MySpace in its site—personal site tools, internal email, friends, blogs, and flirting. The site treats you like an old pal from the beginning and has an easy upload and sharing process that's almost the same as YouTube's. **www.heavy.com**

BLIP.TV

Blip.tv accepts more video formats than YouTube, including the open-source Ogg Theora video format and DivX. Blip.tv is aimed at people who want to have a regularly produced TV series, helping them build an audience and find advertisers. The company recently partnered with the Akimbo Internet video-on-demand service, which showcases its best videos, delivering them to TV sets.
www.blip.tv

RESOURCES

YouTube Tips
www.youtube.com/t/howto_makevideo
www.youtube.com/t/video_toolbox

WIN THIS $3,300 HAVOC PC!

SPECS

MODEL NAME.....CHAOS 775/SLI
MOTHERBOARD AND PROCESSOR.....Asus P5N32-SLI Premium, INTEL CORE 2 DUO E6600
MEMORY.....4GB Corsair XMS DDR2 PC5400
HARD DRIVE.....500GB SATA
VIDEOCARD.....BFG 8800 GTX OC 640MB graphics card

To win, send an email with your name, phone number, and address to winahavocpc@maximumpc.com or send a 4x6 or larger postcard to Win a Havoc PC 4000 Shoreline Court, Ste 400, South San Francisco, CA 94080

CONTEST RULES

No purchase is necessary to win and as a contestant you have not yet won. Entries must be provided through email received no later than May 25, 2007. The winner will be chosen on or about May 30, 2007, and will be notified by email. The odds of winning depend upon the number of entries received. The sponsor of the contest is Future US, Inc. ("Future US"), 4000 Shoreline Court, Suite 400, South San Francisco, CA 94080). Future US cannot be responsible for lost, late, misdirected, or incomplete entries. The prize is a computer (the value of which is $3,311.53) and is not transferable and no substitutions will be allowed. The winner will be determined by a single random drawing of all valid entries and the decision of Future US shall be final. You may obtain the name of the winner by sending a stamped, self-addressed envelope to the address above. This contest is open to residents of the United States only. Entrants must be at least 13 years of age. If a winner is a minor, the prize will be awarded in the name of winner's parent or legal guardian, who is solely responsible for all applicable federal, state and local taxes. If a winner is a minor, that winner must also provide a signed parental or guardian consent form, provided by the sponsor, within seven (7) days of notification attempt. Failure of the minor to return the guardian consent form will result in the forfeiture prize and selection of an alternate winner, who will be chosen through a random drawing from the remaining eligible entries. Return of any prize or prize notification as undeliverable will result in disqualification and an alternate winner will be selected. The winner may be required to sign an affidavit of eligibility/release of liability/prize acceptance within seven days of receipt; failure to do so upon request will result in forfeiture of the prize. By acceptance of the prize, the winner agrees to the use of his or her name and/or likeness for purposes of advertising, trade, or promotion without further compensation, unless prohibited by law. Future US is not responsible for any damages or expenses that the winner might incur as a result of this contest or the receipt of any prize. The winner is responsible for paying any income taxes on the value of the prize received. Void in Rhode Island and Puerto Rico and where prohibited by law.

Ask the Doctor

Diagnosing and curing your PC problems

TIME WARP

ON THE NO BS PODCAST
www.maximumpc.com

I am working on upgrading to Windows Vista Ultimate from Windows XP Media Edition and find that many drivers have not been developed to support my home network. I am afraid I had not read the article that recommended doing a clean install and instead did an upgrade installation. I was told that Vista would allow me to pick my boot drive, so I could switch between operating systems. If this is not possible, could I connect power to just the one I want to boot from?

—John Felice

You can have both XP and Vista running on the same hard drive. In fact, you can install them on different drives, if you so choose, and use your motherboard's BIOS (or key command, if it has one) to select which drive gets the boot.

Unfortunately, as the Doc understands it, you've already gone and installed Vista over your XP installation. While it's certainly possible to slap XP on a separate partition, or even a separate hard drive, the Doc has noticed quite a few users having trouble doing so. Specifically, it appears that the XP installation overwrites the Vista boot manager, which obviously screws up the Vista boot process.

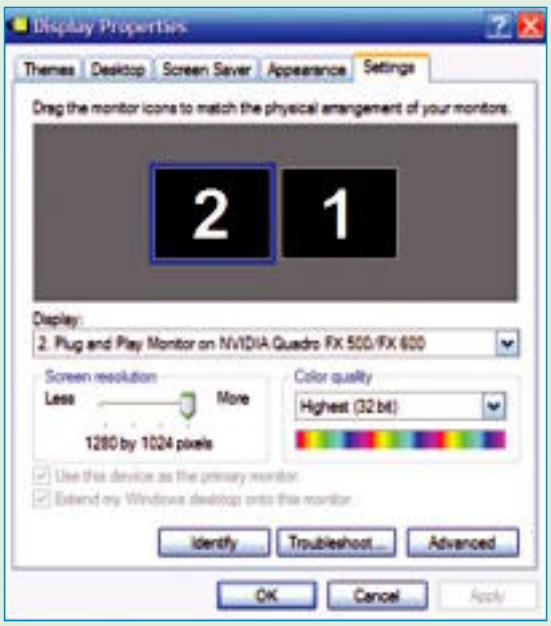
Your best bet is to copy your important files to another location or DVD and then wipe your primary disk and start with a fresh XP installation. From there, boot off your Vista CD and install the OS to your second hard drive. Now, whenever your system boots, the Vista boot menu will give you the lovely choice of which OS you'd prefer to use. And ideally, each OS will be self-configured to see the drive it's installed on as the primary, or C, drive and the other as the secondary, or D, drive.

POWER UP

This isn't something that needs to be fixed, it's just a question: I am thinking about upgrading my LCD monitor. Does it take a more powerful graphics processor to run a widescreen monitor than it does to run a regular 4:3 monitor?

—Steve Ruegsegger

The issue has more to do with native resolution than aspect ratio. LCD monitors look best when driven at their native resolution. More pixels requires more horsepower. A 19-inch display with a 16:9 aspect ratio and native resolution of 1440x900 has only 67,200 more pixels than a 17-inch display with a 4:3 aspect ratio and native resolution of 1024x1200, so you shouldn't experience a significant performance hit when you move up. Switch to a 23-incher—such as the ViewSonic VP2330wb we use to test videocards—and you'll see a major difference. That monitor has a 16:10 aspect ratio and native resolution of 1920x1200, so it has nearly twice as many pixels as either the 17- or 19-inch models in this example.



It's not the size of your videocard that matters; it's your monitor's resolution. And 1280x1024 just isn't that impressive nowadays.

CONGRATS, IT'S TWINS

Is there a performance advantage to having the second SLI card match the first SLI card in every way? The rig in question now runs a PNY Verto GeForce 6800 GS overclocked on an Asus P5ND2 motherboard.

—Edward Cotter

Nvidia did away with the requirement to pair videocards from the same manufacturer some time ago. Both cards must have the same GPU, but they can be from different manufacturers; they can also run at different clock speeds. Since one card will be doing the compositing work (combining the output of both frame buffers and outputting it to your display), it makes sense to put the faster of the two cards in the primary SLI slot. You should also make sure you're using the latest videocard and chipset drivers before proceeding with your upgrade project.

CUT. IT. OUT.

I'm writing because you are my last hope for a solution to a sound problem I've been struggling with for more than a year. It's simple, but annoying: Plugging a headset into my front-panel audio doesn't cut out the speakers. I have a Cooler Master Centurion 5 CAC-T05 case and an Asus A8V-E Deluxe mobo—there is no soundcard. Suggestions?

—Clayton Curtis

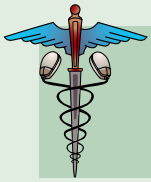
The Doctor thinks it is likely an issue with how the shop wired up the AC97 front-panel header on the system or how the driver is configured on the board. The Doctor believes that particular case has separate header jacks for AC97 audio and HD audio. The A8V-E Deluxe features AC97, so you should use that jack, not the HD audio jack. You'll also want to poke around the control panel for the onboard Realtek ALC850 the A8V-E Deluxe uses. Some onboard audio drivers include an option to mute the speakers when a headphone is detected.

COMPOUND SOUP

I accidentally mixed a metal-based compound with a ceramic-based compound and applied it to my processor. Will this screw anything up?

—Andrew Vance

Most thermal pastes are intended to be used by themselves and are likely more effective that way. However, like peanut butter and chocolate, the two together are unlikely to harm anything. If the machine is not overheating and the two compounds didn't meld to form a molecular acid, you're probably fine. MPC



Alas, the Doctor has been cut to a mere page this month. He understands your sadness, but there's nothing he can do. You see, the Doctor's been moonlighting on the side as a lounge singer and has simply lost much of the free time he had used to answer your questions. But if you send your *really* juicy computer-related problems to **doctor@maximumpc.com**, he'll stop singing for tips and come back to the operating table.

White Paper: Distributed Computing

Discover how to render the PC under your desk more powerful than the world's burliest supercomputer.

BY GORD **GOBLE**

Stating the obvious, no single PC can muster more computational muscle than a supercomputer. But when a distributed computing application harnesses your PC's computational power in parallel with that of thousands of other PCs, the silicon collective can efficiently tackle incredibly complex problems. While you're reading this, tens of thousands of PCs that would otherwise be sitting idle are crunching numbers to assist in efforts that range from the search for signs of extraterrestrial intelligence to the development of cures for debilitating diseases.

Modern games are resource hogs that require prodigious amounts of computational power, but when you're checking your email, writing a document, calculating your taxes, or using your rig for other mundane tasks, you're utilizing just a fraction of its capabilities. Install a distributed computing app, and you can easily tap that potential for the benefit of all humankind.

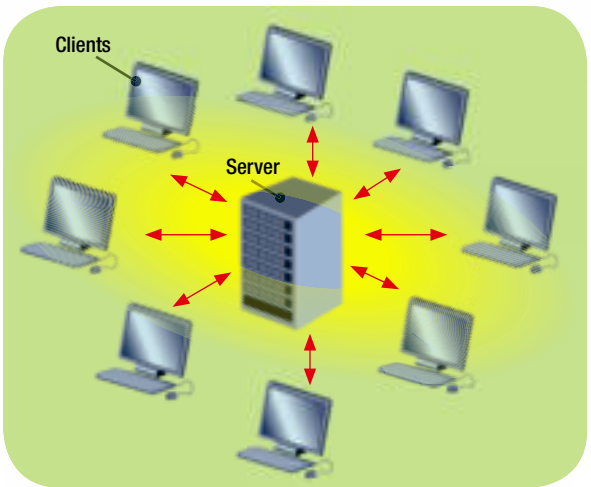
Proponents of distributed computing seek to solve particularly daunting problems by divvying them into bite-size portions and passing the chunks to individual PCs for processing; they then collect the finished results and compile them to derive the ultimate solution. The idea got off the ground at a time when mainframe and midrange systems were de rigueur and the widespread use of personal computers was uncommon. The proliferation of increasingly sophisticated PCs, coupled with the spread of electronic communication and the growth of the Internet in general, has rendered the idea significantly more relevant and increasingly popular.

The University of California at Berkeley has developed two well-known implementations: SETI@home (**setiathome.berkeley.edu**), which searches radio-telescope data for signs of extraterrestrial intelligence, and Stardust@Home (**stardustathome.ssl.berkeley.edu**), which painstakingly searches for submicroscopic interstellar dust collected and returned to Earth by NASA's Stardust spacecraft.

IBM's World Community Grid (**www.worldcommunitygrid.org**) engages in a range of humanitarian causes, and Distributed.net (**www.distributed.net**) employs a million-monkeys-at-a-million-typewriters technique to decipher mortifyingly complex cryptography.

HOW IT WORKS

The divide-and-conquer approach to problem solving



A central server chops a complex computing task into thousands of small chunks and sends them out to client PCs owned by altruistic volunteers. These clients perform their calculations using whatever spare CPU cycles are available, send the results back to the server for compiling, and ask for the next batch of work.

NUMBERS TRUMP SIZE

Every distributed computing project shares several key traits, and each depends on an army of volunteers whose PCs are connected to a central server via Internet-enabled client software. The process functions in a way that is similar to how a modern supercomputer works—nearly all of which are now constructed from thousands of CPUs running in parallel—except that the CPUs in a distributed computing project can be located all over the world instead of housed in a single location.

Tackling a complex problem through distributed computing costs much less than doing so using supercomputers because volunteers foot the bill for the equipment and the power needed to operate it. The trade-offs for using other people's computers is the inevitable ebb and flow of resources as volunteers join the project and others lose interest. It's very difficult to predict how many processor cycles will be available at any given time. Project administrators encourage participation by appealing to one's sense of altruism, fostering competition, and offering prizes and feel-good awards to the individuals and teams delivering the most calculations.

Stanford University's Folding@Home (**folding.stanford.edu**) has been particularly successful in this respect. The project, which examines the connection between protein molecules and diseases such as Alzheimer's and Parkinson's, has garnered hundreds of thousands of volunteers, many of whom have organized themselves into competitive teams. (If you'd like to join Team Maximum PC, download the client at the project's website and join team 11108; then be sure to visit the Maximum PC Folding forums at **www.maximumpc.com/forums**.)

When you volunteer for such a project, your first order of business is to download and install a small software package. Distributed computing projects are designed to leave a very small footprint on each individual PC. Some projects use algorithms that run inconspicuously in the background, sipping a miniscule allotment of the PC's available power; others kick in—typically as a screensaver—only when the computer is otherwise inactive.

In the typical scenario, as soon as the client PC finishes processing a batch of

work, it automatically reports to the project's server, uploads the results, and fetches a new assignment. Even projects that require human input—such as Stardust@Home's needle-in-a-haystack visual interstellar dust search—place minimal demands on the client hardware.

Spurred by the growing popularity and vast potential of distributed computing, there's now new application software that can be adapted to virtually any project whose needs are compatible with the limitations of distributed computing (problems can be easily broken into chunks, and there is no requirement for communication between nodes). Berkeley Open Infrastructure for Network Computing (BOINC) is just one example. Originally developed for SETI@home, BOINC is open-source software that allows scientists and managers to concentrate on their research projects instead of designing and rolling out proprietary client-server software. Volunteers who download BOINC can configure it to run several BOINC-compatible distributed-computing projects on their rigs.

IT'S NOT JUST FOR CPUS

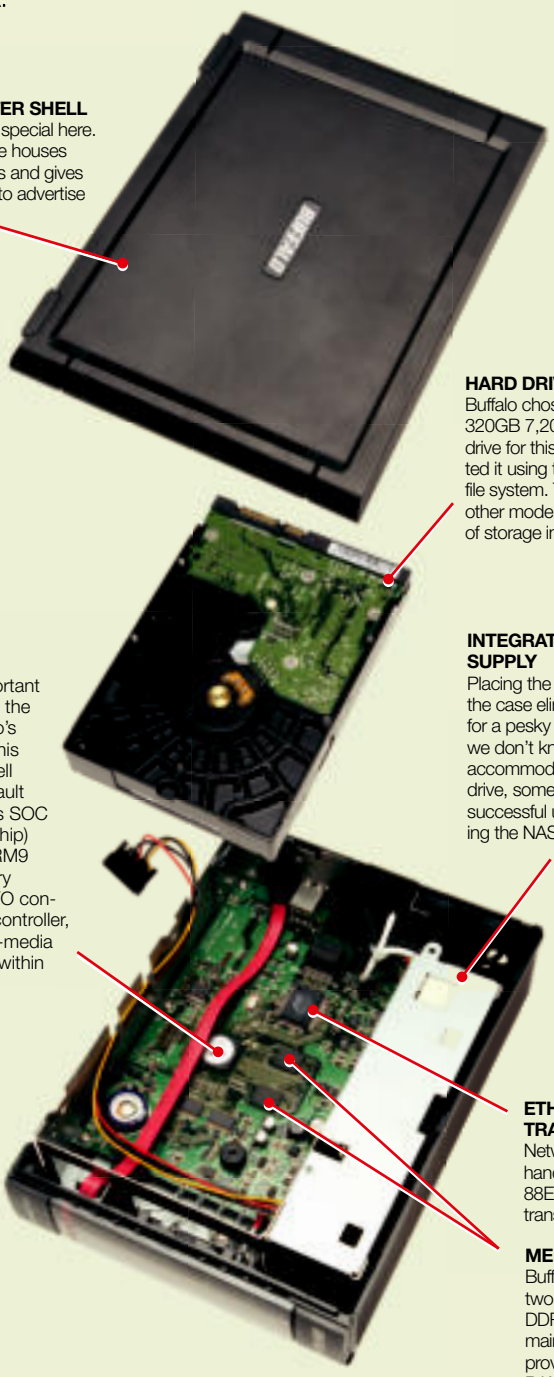
Most distributed computing projects utilize idle CPU cycles, but the ever-increasing floating-point computational power of graphics processors is also beginning to attract attention. Stanford's Folding@Home, for instance, now offers a client that performs certain molecular-dynamics simulations entirely on the GPU's pixel-shader processors.

Folding@Home specifically recommends running this client on ATI's X1900-series videocards outfitted with 512MB of RAM. The GPU client is still in beta, so it's a little tricky to get running. However, beta testers see significant performance increases using the GPU-friendly software, and Folding@Home expects to improve the beta results considerably before the client goes final.

Folding@Home wants to invite console gamers to contribute to the cause, too. It's developing a folding client that will run on the Cell processor at the heart of Sony's PlayStation 3. The client will also tap the capabilities of the RSX chip that Nvidia developed for Sony to render the actual folding process in real time, complete with high dynamic-range lighting. Using a PS3 gamepad, you'll be able to examine the protein from any angle. With just 10,000 client machines—either PCs with X1900-series GPUs or PS3 gaming consoles—Stanford expects to reach petaflop performance: That's one thousand trillion floating-point operations per second. Take *that*, BlueGene/L! MPC

Network-Attached Storage (NAS)

A NAS box makes data available to every PC on your network without tying up an entire PC to act as a server. Buffalo Technology's LinkStation Pro delivers performance akin to a USB hard drive's, so we cracked open this 320GB version to find out what makes it tick.



PLASTIC OUTER SHELL
There's nothing special here. The vented case houses the components and gives Buffalo a place to advertise its brand.

HARD DRIVE
Buffalo chose a Western Digital 320GB 7,200rpm SATA 3G drive for this model and formatted it using the Linux/SGI XFS file system. The company offers other models with up to 750GB of storage in the same chassis.

SYSTEM ON A CHIP
The most important component on the LinkStation Pro's mainboard is this 400MHz Marvell Orion Media Vault processor. This SOC (system on a chip) includes an ARM9 CPU, a memory controller, an I/O controller, a USB controller, and streaming-media capabilities all within the core.

INTEGRATED POWER SUPPLY
Placing the power supply inside the case eliminates the need for a pesky wall wart. Although we don't know if this PSU can accommodate a larger hard drive, some users have reported successful upgrades after updating the NAS box's firmware.

ETHERNET TRANSCEIVER
Network connectivity is handled by this Marvell 88E1111 Gigabit Ethernet transceiver.

MEMORY
Buffalo solders two 512Mb Elpida DDR2 chips to the mainboard, which provides 128MB of RAM. The device runs an embedded version of Linux.

Any requests? What hardware—new or old—would you like to see go under *Maximum PC's* autopsy knife? Email your suggestions to **input@maximumpc.com.**

Preview

Alienware Aurora M9750

Core 2 Duo and SLI prepare to lap dance

SLI in notebooks isn't a new thing, but it's never been this portable or this powerful. We take an early look at Alienware's upcoming Aurora M9750, which couples a unique hybrid Intel/Nvidia chipset with a sizzling-fast Core 2 Duo processor.

—GORDON MAH UNG

Alienware's Aurora M9750 will be the first 17-inch notebook to pair a Core 2 Duo with SLI graphics.

The original incarnation of mobile SLI had a few shortcomings, with the most glaring being CPU performance limitations. Although those early Clevo designs did pack two GeForce Go 7800 GTX cards, they also topped out with AMD's single-channel, single-core 2.4GHz Turion 64 ML-44, which is not the peppiest chip in the pack. Overall, mobile SLI wasn't a pretty picture.

Second-gen mobile SLI is a little better. Alienware's Aurora M9750 sports faster videocards—the GeForce Go 7950 GTX, to be exact. Each of the two GPUs is clocked at 575MHz, paired with 512MB of 700MHz GDDR3 memory, and mounted in an MXM Type III module. The GeForce Go 7950 GTX boasts 28 percent more memory bandwidth and 44 percent higher fill rates and vertices per second than the older GeForce Go 7800 GTX.

But the real surprise comes from the chipset: While all the Turion-based SLI notebooks used a variant of Nvidia's nForce4 SLI chipset, the Aurora features a hybrid Intel/Nvidia chipset. Nvidia calls its new chipset the nForce SLI 100, and the Nvidia silicon sits between the two graphics cards and a standard Intel 945PM north-bridge memory controller. This level of cooperation is unprecedented!

Chipset nerds know that even though SLI was originally developed on an Intel chipset, Nvidia disabled SLI for Intel chipsets long ago in order to keep SLI users on its nForce wagon. Nvidia sidesteps this issue with the Aurora and the SLI 100. The company tells us the SLI 100's configuration is similar to that of a desktop GeForce 7950 GX2 card in that the chip bridges the two GPUs. Both MXM modules can also communicate across the MXM connector without hitting the CPU or chipset. But where the desktop 7950 GX2 bridges the two GPUs at just x8 speeds, Nvidia says the SLI 100 works at a full x16 clip.

But here's the catch: Even though the two videocards are connected to the Nvidia chipset using a x16 link each, the SLI 100 chipset is connected to the Intel chipset using a single x16 link. It seems like the single link between the Nvidia and Intel chipsets would create a bandwidth gap, but Nvidia maintains that it's not a problem. Then again, we're obliged to point out that we haven't seen a tremendous difference in performance when running a pair of GPUs in two x16 slots compared to cards running in two x8 slots, either.

Getting back to the Aurora M9750, the notebook didn't disappoint in our early testing. The notebook Alienware sent us is a one-of-a-kind prototype, so we're reluctant to publish full test results at this time, but the machine scored close to 9,000 on the 3DMark06 benchmark. This was with SLI enabled and the 17-inch screen at its native resolution of 1920x1200. Turning off SLI cut that score neatly in half. The GPUs don't deserve all the credit, though; some of this performance can be attributed to the M9750's 2.33GHz Core 2 Duo T7600, a CPU that is considerably faster than a single-core, single-channel Turion 64.

The M9750 does look promising. Gaming and notebooks—even the large, high-powered models—have been at a disconnect because a notebook's display resolution pushes the limits of what any single notebook GPU can deliver. This is especially true when you factor in necessary anisotropic filtering and antialiasing. SLI should alleviate that. Don't expect great battery performance, though. We measured the Aurora drawing 190 watts at the wall socket while running 3DMark06, so expect it to suck battery power down like a big-block V-10 guzzles gas.

Alienware told us this machine was 90-percent ready when we received it, but we did encounter some BIOS and driver issues: The OS reported only 1.37GB of the 2GB of DDR2/667 as being free, and the RAID drivers were nonfunctional. The company expects to have a fully operational unit to us in time for a full review in our June issue, and we're looking forward to it. MPC

KATHERINE **STEVENSON**

Uncovers an HDCP Hitch

Vendors claim to be on board with copy protection, but their methods can be at odds

Today's pricey 30-inch LCDs force you to play protected content at a substandard resolution.

You'd think that screens offering the ultimate in desktop resolution—such as the 30-inch LCDs we review on page 38—would be ideal for displaying high-def content, right? Think again. Despite their native 2560x1600 resolutions, these 30-inch screens are restricted to 1280x800 res when playing commercial Blu-ray and HD DVD discs.

There are two parts to this problem. The first is that neither ATI nor Nvidia supports HDCP on a dual-link signal, even on their newest cards. But that alone would only limit HDCP content to a 1920x1200 resolution, which is sufficient to play today's 1080p content at its native resolution.

The other side to the problem is that today's 30-inch desktop LCDs support only two resolutions: their native 2560x1600 and half that—1280x800—due to the absence of an internal scaler, something most other, smaller LCDs possess. Most people won't be aware of the screens' resolution restrictions because you can freely change the resolution in the display control panel, and the picture adjusts on the screen just as it should. But the fact is, the videocard alone scales the image—when you set a 1920x1200 resolution, for example, the videocard sends a 2560x1600 signal; it just doubles some of the pixels to create a larger image. Interestingly, when using a GeForce 7950 GTX with the latest drivers under Windows XP, I specifically tried to force monitor scaling, but the card handled scaling duties regardless of the control panel's indicated setting. Using a GeForce 8800 GTX with Nvidia's 100.64 drivers under Vista, the selection automatically reverts to "display adapter scaling" after you make any adjustments. The ATI control panel offers no such options—the card just handles the scaling automatically.

So you see the dilemma: If the cards had dual-link HDCP, they would be able to play a protected signal at the screen's native res or even interpolate that signal down to any other res—just as they do with unprotected content. On the other hand, if the screens included an internal scaler, they would be able to play the protected single-link signal at an acceptable 1920x1200. O. Henry couldn't have written it better!

Reps from both Nvidia and ATI were noncommittal when we contacted them about the prospect of adding dual-link HDCP support to their cards. All is not lost though; we believe that 30-inch LCD technology will mature over time and displays will include more features, such as scalers, just as their more common-size predecessors do. In the meantime, we recommend holding off on any 30-inch display purchases because the current implementation has too many compromises.

Gordon Mah Ung

Ponders Overeager System Vendors

Who's to blame for the run of unstable systems we've seen?

Since the beginning of the year, we've had nothing but bad luck with the desktop systems we've reviewed. Many of the gaming systems we've tested lately have had one thing or another wrong with them, from random crashing to cranky drivers—the problems are severe enough to cause us to give a number of rigs (some from vendors with pretty good track records) very low scores.

Our hands are tied though. When we review a PC, we strive to emulate the consumer's experience. When you've just laid out five large for the ultimate PC, you'd spit nails if it started to lock up on you from the get-go.

Whose fault is it? The majority of blame falls on the system vendors. After all, their names are on the systems and their tech support is on the other end of the 800 line. But I also sympathize with them. It's hard to stand out in the crowd when everyone is using the same hardware and drivers. Most vendors look to overclocking as the easy way out. But overclocking is unpredictable, and it has been responsible for problems we experienced with two machines we recently tested.

So why overclock? Vendors are in a quandary. Intel's quad-core CPU can't compete with its dual-core brother in many of today's games and apps unless it's overclocked to a comparable clock speed. This catch-22 won't clear up until Intel's quad-core clock speeds surpass its dual core's speeds or AMD introduces its updated Athlon 64 quad core this summer. Until then, we're likely to see more overclocked quad-core boxes submitted for review—and we'll continue to issue harsh verdicts for rigs that step one megahertz over the line.

How We Test

Real-world benchmarks. Real-world results

Computer performance used to be measured with synthetic tests that had little or no bearing on real-world performance. Even worse, when hardware vendors started tailoring their drivers for these synthetic tests, the performance in actual games and applications sometimes dropped.

At *Maximum PC,* our mantra for testing has always been "real world." We use tests that reflect tasks power users perform every single day. With that in mind, here are the six benchmarks we use to test every system we review.

SYSmark2004 SE: This is an update of the SYSmark2004 benchmark, which uses a suite of such common applications as Microsoft Word, Excel, PowerPoint, Macromedia Dreamweaver, Flash, and Winzip to test general performance. It isn't heavy in multithreading, but it does feature multitasking tests.

Adobe Premiere Pro 2.0: We finally ditched our old standard-def Premiere test for one that uses high-def source material. The test is multithreaded, uses the GPU for transitions, and is brutal. It takes about an hour on our zero-point to render a short two-minute, 46-second benchmark movie in the program.

Adobe Photoshop CS2: We start with a RAW photo shot with a Canon EOS 20D, and apply a crapload of filters and other tasks from CS2 to see just how fast a rig can chew through the workload. Because we use every filter we can, the test is more fair and balanced than the usual cherry picking of Photoshop tests.

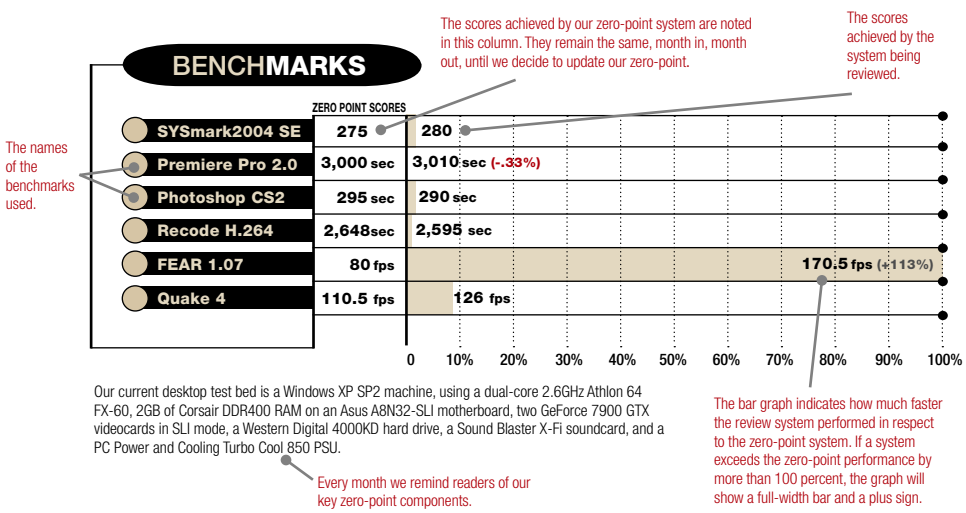
Ahead Nero Recode 2.0: Nero Recode 2.0 is one of the fastest video-transcoding utilities. We copy unencrypted VOB files to the hard drive, then convert the movie to an H.264 file formatted for the Apple iPod's screen. The version included with Nero 7.5, is the only multithreaded H.264 encoder we've found thus far and is optimized for dual-core CPUs.

Quake 4: Based on the Doom 3 engine, Quake 4 is a popular OpenGL game. We run our test at 1600x1200 with 4x antialiasing and 4x anisotropic filtering. Generally, more robust OpenGL drivers yield better performance. We use a custom timedemo recorded using the 1.2 patch, which supports Hyper-Threading and dual-core processors.

FEAR: Monolith's FEAR is a cutting-edge DirectX game that pushes PCs and graphics hardware to the limit. We run FEAR at 1600x1200 with soft shadows, physics, and audio acceleration enabled, using the 1.07 patch.

How to Read Our Benchmark Chart

Maximum PC's test beds double as zero-point systems, against which all review systems are compared. Here's how to read our benchmark chart.



Our current desktop test bed is a Windows XP SP2 machine, using a dual-core 2.6GHz Athlon 64 FX-60, 2GB of Corsair DDR400 RAM on an Asus A8N32-SLI motherboard, two GeForce 7900 GTX videocards in SLI mode, a Western Digital 4000KD hard drive, a Sound Blaster X-Fi soundcard, and a PC Power and Cooling Turbo Cool 850 PSU.

Every month we remind readers of our key zero-point components.

The bar graph indicates how much faster the review system performed in respect to the zero-point system. If a system exceeds the zero-point performance by more than 100 percent, the graph will show a full-width bar and a plus sign.

BEST OF THE BEST

Our monthly category-by-category list of our favorite products. New products are in red.

High-end videocard
Asus EN8800 GTX

Midrange videocard
EVGA e-GeForce 8800 GTS (320MB)
The first midrange card we've tested with DX10 capabilities

Soundcard
Creative Labs X-Fi Xtreme Music

Hard drive
Seagate Barracuda 750GB 7200.10

External backup drive
Western Digital Dual-Option Media Center 320GB

Portable USB drive
Maxtor One Touch III 100GB

DVD burner
Plextor PX-755SA

High-end LCD monitor
Dell 2707WFP
Add three inches and a sexier look to our previous Dell fave and you get our new pick

Budget LCD monitor
Samsung SyncMaster 206BW

Socket AM2 Athlon 64 mobo
Gigabyte GA-M59SLI-S5

Socket 775 Core 2 Duo mobo
Asus Striker Extreme

HD-based MP3 player
Apple iPod

Flash-based MP3 player
SanDisk Sansa e280R

5.1 speakers
M-Audio Studiophile LX4 5.1 (LX4 2.1 with 5.1 Expander System)

2.1 speakers
M-Audio Studiophile LX4 2.1

Midtower case
Antec Nine Hundred

Full-tower case
Gigabyte 3D Aurora 570

Games we are playing
Dark Messiah of Might and Magic, War Front: Turning Point, Titan Quest: Immortal Throne, Supreme Commander, World of Warcraft: The Burning Crusade, Battlefield 2

Smooth Creations Diablo

Does a great paint job make it a great PC?

Smooth Creations's reputation for being the best case painter is secure.

As one of the top case painters in the nation, Smooth Creations has more in common with Tiger Woods, Joe Montana, and Michael Jordan than most of us ever will.

So what do you do when you're at the top of your game? You look for other kingdoms to conquer. That's just what Smooth is hoping to do with its new Diablo system. The company has cut out the middleman by both painting the case and building the PC.

But what does a company that cut its teeth painting cases know about making PCs? That's what we wondered when we uncrated the Diablo. The system, as well as a mouse, keyboard, speakers, monitor, iPod, and iPod dock, came with Smooth's signature paint job, which is still the best in the business. The case itself is a variant of Cooler Master's CM Stacker 830, which is no surprise, as Smooth has signed a deal to exclusively paint for the case company. Smooth also uses a new Cooler Master Aquagate Nano and a 1KW PSU. The Nano is similar in style to the Gigabyte cooler we spied in the ABS Ultimate X III that we reviewed in February. Both sport low-velocity fans to keep air moving over the chipset fan and voltage modules—a must if you're water-cooling.

All that's fine, but what about performance? Unfortunately, despite its storied name, we found the Diablo wanting. To keep costs down, Smooth skipped the quad-core 2.66GHz Intel Core 2 Extreme QX6700 for a much cheaper 2.66GHz dual-core Core 2 Duo E6700. The chip was clipped into an EVGA 680i SLI board with 2GB of Mushkin DDR2/800. Smooth overclocked the CPU a tad to 3GHz, so it should offer performance equal to Intel's top dual core. Smooth apparently doesn't believe that quad core is a necessity today. That we understand—we don't agree, but we understand when someone opts out of quad core today for a gaming rig. However, Smooth really aimed low by striping two 250GB WD2500KS drives. Huh? When 500GB drives are pushing the $150 mark, we just don't get it, especially with no drive to back up that RAID 0 data.

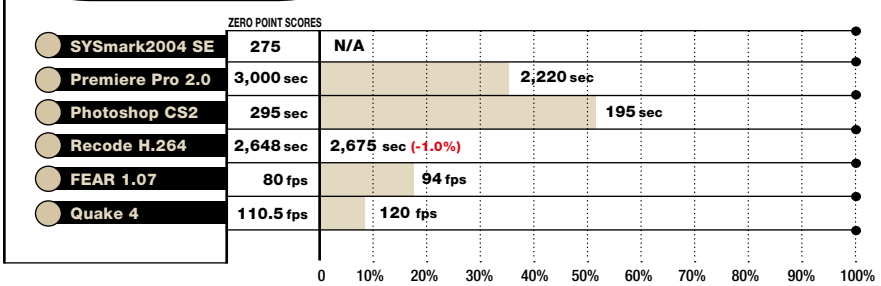
The company didn't skimp on graphics though—it equipped the box with a pair of custom-painted XFX GeForce 8800 GTX cards. But here's where it gets interesting: Smooth shipped us the system with Microsoft Vista Home Premium installed. Due to Nvidia's piss-poor Vista drivers, that made the Diablo the slowest gaming rig we've tested in almost half a year, managing to outscore the previous slowpoke, Polywell's Poly I680SLI-QX, only in Photoshop CS2 (Photoshop favors clock speeds over cores). If we reach back to January to compare numbers with the Maingear F131 quad box, the Diablo gets crushed big time. Heck, SLI in Vista apparently doesn't do *anything* today. Is it Smooth's fault that Nvidia is behind in driver development (or is it a problem with gaming and Vista)? No, but the company could have opted to simply skip installing Vista in its gaming rigs—even Dell ships its gaming rigs with XP.

That puts the Diablo in limbo. Of all the machines we've tested this year, it certainly is the most beautiful. But it's also the absolute slowest and gets its benchmarking head handed to it in almost every category. Part

UNDER THE HOOD

BRAINS	
CPU	Intel Core 2 Duo E6700 (2.66GHz dual core)
MOBO	EVGA 680i SLI
RAM	2GB Mushkin DDR2/800 (Two 1GB sticks)
LAN	Dual Gigabit LAN (Nvidia)
HARD DRIVE	Two 250GB WD2500KS (7,200rpm SATA) in RAID 0
OPTICAL	Lite-On SOHC-5236V, Lite-On LH-201H
BEAUTY	
VIDEOCARD	Two XFX GeForce 8800 GTX SLI (576MHz core, 900MHz RAM)
SOUNDCARD	Sound Blaster X-Fi XtremeAudio
CASE	Cooler Master Stacker 830 SC
BOOT: 51 sec.	DOWN: 8 sec.

BENCHMARKS



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The custom paint job doesn't stop at the case—Smooth also hit the pair o' XFX 8800 GTX cards with a touch-up.

The total package from Smooth nets you a custom painted iPod and mouse, along with speakers, a monitor, a keyboard, and an iPod dock.

of that is Vista's and Nvidia's fault, but Smooth isn't blameless for including a second GPU that's just warming a slot. The second card should get 86ed for a quad core, which will at least get you some performance today in Vista or, at the very least, damn-good multitasking.

So the Diablo's only compelling attribute is presentation. For an additional $1,500, you get a gaming keyboard, mouse, monitor, speakers, iPod, and iPod dock with the same custom paint job applied to them. As a package, it's quite impressive, but color us disappointed that the machine didn't post better numbers.

—GORDON MAH UNG

SMOOTH CREATIONS DIABLO

DIABLO

You could cruise the Sunset Strip on this case and people would be jealous.

EL DIABLO

An odd assortment of subpar parts and pathetic SLI drivers shoot this system in the foot.

7

$5,000 (system only), www.smoothcreations.com

EVGA e-GeForce 8800 GTS Superclocked 320MB

Nvidia lowers the barrier to DX10

It doesn't matter how great Nvidia's 8800 GPUs are if you can't swing the cash to buy one. Well, Nvidia feels your pain: The company has produced a less-expensive version of its GeForce 8800 GTS reference design; even better, it didn't sacrifice much performance to achieve that lower cost.

The only physical difference between this card and the 8800 GTS models we examined in January is the size of the frame buffer, which is 320MB, half the size of the buffer in the earlier cards. Both designs feature a 320-bit memory interface, 96 stream processors, and identical coolers. And now that Nvidia allows 8800s to be overclocked, EVGA's card comes from the factory with higher clock speeds than the first crop of 640MB 8800 GTS cards we examined: a 576MHz core and 850MHz memory versus stock 513MHz and 792MHz clocks, respectively.

BENCHMARKS

We received products from several vendors, so we compared

	EVGA E-GEFORCE 8800 GTS (FACTORY OVERCLOCKED)	GEFORCE 8800 GTS 320MB (STOCK CLOCK)	EVGA CARDS IN SLI
3DMARK06 GAME 1 (FPS)	**17.7**	16.5	26.7
3DMARK06 GAME 2 (FPS)	**17.8**	16.4	29.7
QUAKE 4 (FPS)	**79.0**	72.3	127.6
FEAR (FPS)	**38**	36	60

Best scores are bolded. All benchmarks run with 4x AA and 8x aniso. FEAR tested with soft shadows on; Quake 4 tested in high quality. Cards were installed in an EVGA nForce 680i SLI motherboard with a 2.93GHz Intel Core 2 Extreme X6800 CPU and 2GB of Corsair DDR2 RAM.

DirectX 10 is getting closer in affordability, if not reality.

EVGA's overclocked model with a stock-clocked 320MB GTS board. Giving up half the memory means losing support for very high resolutions and large-screen monitors. Owners of 30-inch panels with 2560x1600 native resolutions should spring for either the 640MB version of this card or go for the 8800 GTX with its 768MB frame buffer. You also can't run Quake 4 in ultra quality with this card—doing so demands 512MB of memory. Running two 320MB cards in SLI lends a significant performance boost but doesn't combine the two buffers to create 640MB of display space.

You won't need to dial back on the anisotropic filtering, though: We saw only a negligible performance increase when we cut aniso settings to 8x from 16x. Playing FEAR at 38fps at 1920x1200 with 4x AA and 8x aniso on a card in this price range is remarkable.

—MICHAEL BROWN

EVGA E-GEFORCE 8800 **9**

$330, www.evga.com

MAXIMUM PC KICKASS

XFX GeForce 7600 GT Fatal1ty

Hush! I'm in the middle of a game!

The problem with high-performance GPUs is that they generate lots of heat and draw lots of power. Manufacturers then have to saddle their videocards with loud cooling fans, and system builders have to install big power supplies—which engender their own heat, cooling, and noise issues.

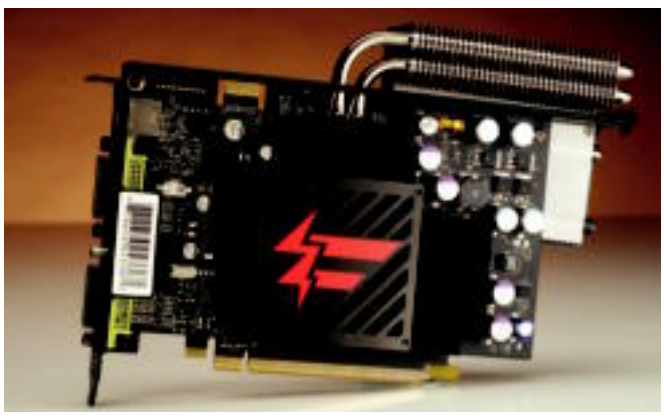
XFX got around these problems by using one of Nvidia's lesser GPUs: the GeForce 7600 GT. Bearing the Fatal1ty moniker, XFX's 7600 GT draws all the power it needs from the PCI Express bus. This card is absolutely silent, thanks to XFX's "Silent But Deadly" cooling.

A heatsink covering the GPU and memory modules is attached to a pair of heat pipes, which dissipate warm air over an aluminum radiator. The radiator adds 0.75 inches to the card's thickness and hangs two inches off the back of it, so we had to move our X-Fi soundcard to another PCI slot for SLI testing.

BENCHMARKS

	XFX GEFORCE 7600 GT FATAL1TY (1920X1200)	XFX GEFORCE 7600 GT FATAL1TY (1280X720)	XFX GEFORCE 7600 GT FATAL1TY IN SLI (1920X1200)
3DMARK06 GAME 1 (FPS)	7.6	11.9	13.3
3DMARK06 GAME 2 (FPS)	11.1	18.4	20.3
QUAKE 4 (FPS)	30.5	49.9	59.2
FEAR (FPS)	21	47	42

All benchmarks run with 8x aniso. 3DMark06 tested with AA off. FEAR tested with soft shadows on and AA off; Quake 4 tested in High Quality with 4x AA. Cards were installed in an EVGA nForce 680i motherboard with a 2.93GHz Intel Core 2 Extreme X6800 CPU and 2GB of Corsair DDR2 RAM.



The passively cooled XFX 7600 GT Fatal1ty is a good choice for home-theater rigs, but builders should take into account that the card supports analog video-out, but not video-in.

With the GPU factory-overclocked to 650MHz and the memory running at 800MHz (stock speeds are 560MHz and 700MHz, respectively), it didn't take much of a load to render the card too hot to touch. Nvidia's nTune software reported GPU temps of 52C at idle, rising up to 71C during active benchmarking.

Heat didn't impact the card's benchmark performance: Despite the GPU's narrow 128-bit memory interface, we achieved a decent 30.5fps in our Quake 4 benchmark and 21fps in FEAR running at 1920x1200. This card is a good value, but buyers should note that it's not DX10 compatible and cannot perform high dynamic-range lighting and antialiasing at the same time.

—MICHAEL BROWN

XFX FATAL1TY **8**

$160, www.xfxforce.com

The Athlon 64 Lonely Hearts Club

We wouldn't recommend it, but here are two AM2 boards if you want to stick to your K9 guns

A sexy, red PCB and lighting can't make up for the faux pas—like an interminable lack of PCI slots.

When your team's on top, it's easy to be a fan. But the true test of fandom is staying with your team even after it's suffered a horrible 2-14 season. Although the last 11 months haven't been quite that bad for AMD CPUs, it has certainly felt like one drubbing after another, as Intel's stellar Core 2 chips have consistently spanked their AMD counterparts in... well, pretty much everything.

But you don't care because you're an AMD superfan (da Athlons). And while the current crop of X2 and FX procs should be retired or traded away, you have faith that this summer will bring a new CPU star worthy of your PC. Just for you, we're testing two hot new contenders that pack SLI, full Vista support, and even some spiffy new tricks as we pit old rivals Abit and Asus against each other.

—GORDON MAH UNG

ABIT FATAL1TY AN9 32X

In a recent motherboard roundup we made a terrible mistake by saying that only Nvidia's even-numbered chipsets were worth a damn. But who can blame us? We were giving the late-to-the-game nForce 590 SLI Intel Edition a hard time, and we completely forgot about its outstanding sibling, the AMD-based nForce 590 SLI.

Of course, it didn't help that AMD systems and motherboards scurried for cover when the Core 2 showed up. For AMD aficionados planning on running dual cards but not two physical CPUs, the nForce 590 SLI is still the go-to chipset.

The Fatal1ty AN9 32X gives us Abit's interpretation of what a 590 SLI board should be. Using a striking red PCB and matching perimeter LED lighting, the AN9 is one of those boards that just begs to be put on display in a case window.

If only looks were all that mattered. The board's cooling setup confused us. Why use beefy heatsinks and heat pipes to cool the south bridge and voltage modules if the north bridge is left to fend for itself? With active cooling, it should be fine, but water-cooling setups are likely to see the north bridge hit high temps without the prop wash of a heatsink.

Abit also seems to have sourced its PCI-E slots from a vendor that hasn't been keeping up with current events. While the x16 PCI-E slots have quick releases, they're on the *wrong* side. To pull a double-wide card, you've got to curl your finger under it and fish for the release.

These are pretty minor complaints compared to our issue with the slot configuration though. We're not big fans of Realtek audio these days—even if Abit uses a riser card to get it up away from the electrically noisy mobo surface. And if you've loaded two double-width GPUs, you're left with no PCI slots for a soundcard on this board. But not everyone runs SLI, you say? Well, then why buy an enthusiast SLI board?

Not all is amiss, though. While Asus can't place SATA ports on its 590 boards to save its life, Abit places them perfectly; all ports are accessible, even if you're using today's oversize videocards.

The Fatal1ty delivered an interesting mix when we benchmarked it. As expected, in most benchmarks, its scores were similar to what the Asus board also reviewed in this article produced. However, we couldn't get PCMark05's hard drive test to work. That failure also dragged down the overall PCMark score for the board. To see if there was a hard drive performance issue with the board, we also ran HD Tach and didn't see anything out of the ordinary. Valve's Particle test, however, did produce some interesting results. There, the Fatal1ty fell behind the Asus by about 10 percent. That test is a CPU pig but is slightly sensitive to memory latencies. In real-world gaming though, the Abit

BENCHMARKS

	ABIT FATAL1TY AN9 32X	ASUS M2N32-SLI PREMIUM
SISOFT XI (MB/S)	8,492	**8,528**
QUAKE 4 1280X1024 (FPS)	**140**	139.2
3DMARK2001 SE	37,015	**37,511**
3DMARK05	11,148	**11,204**
3DMARK06	6,237	**6,502**
3DMARK06 CPU	**2,291**	2,242
FEAR 1.07 (FPS)	**202.0**	191.5
PCMARK05 OVERALL	2,889	**7,162**
PCMARK05 CPU	6,120	**6,149**
PCMARK05 RAM	**5,507**	5,435
PCMARK05 GPU	**8,879**	8,812
PCMARK05 HDD	WNR	6,618
VALVE PARTICLE TEST	37	**41**

Best scores are bolded. We used a 3GHz AMD Athlon 64 X2 6000+, 2GB of Corsair DDR2/800 Dominator RAM, A 74GB Western Digital 10,000rpm SATA drive, a GeForce 7900GTX and a 1KW PC Power and Cooling PSU for both motherboards.

performed acceptably.

That leaves the AN9 Fatal1ty board in murky waters. Although it's attractive, there are better choices in 590 land.

ABIT FATALITY AN9 32X

THE FORCE
Sexy PCB and LEDs makes it a better choice for cases with windows.

MIDI-CHLORIANS
Poor slot layout limits ability to use a soundcard.

7

$180, www.abit-usa.com

ASUS M2N32-SLI PREMIUM VISTA EDITION

If you read our review of the Asus M2N32-SLI Deluxe back last September, you've pretty much seen this board before. Asus took an old standby, updated the driver disc, added a few trinkets to the box, and subbed the onboard Wi-Fi for onboard flash RAM to create a "Vista Edition" board.

Normally, recycling old hardware to jump on the latest technology bandwagon gets a stiff rebuke from us, but Asus's Vista Edition board sports some truly unique features that impressed even the most jaded editors here.

The most noticeable perk is the nifty ScreenDuo auxiliary display, which works with Vista's SideShow gadgets (see the sidebar for more info). It is, essentially, an external auxiliary display for your PC that works as a tiny picture frame or RSS feed reader.

Other enhancements include an optional trusted platform module and an IR remote, which can adjust the volume and even turn the machine on and off. Asus also ripped out the 802.11g module that was in the Deluxe Wireless Edition and subbed in 512MB of flash RAM. The flash RAM is connected to the board via USB, which Vista can access as part of its ReadyBoost feature.

Asus repackaged an '06 motherboard for the '07 OS and tossed in a couple of interesting extras.

Beyond those enhancements, the M2N32-SLI Premium could easily be mistaken for the older Deluxe version, which is both good and bad. The Deluxe was a fine board, but we took issue with its layout problems, which are replicated here. The most egregious of these is SATA placement: The board offers a total of eight ports, but two will be blocked if you install long videocards. Grrr. The new Premium version also takes a backseat to Gigabyte's GA-M59SLI-S5, which offers a third x16 PCI-E slot and a PCI slot.

The Asus board narrowly beats the Abit in a few performance benchmarks, but the boards are essentially indistinguishable. (We conducted performance testing using Windows XP, but since Asus claims Vista support out of the box, we also tested for compliance with Vista to ensure the included DVD of utilities and drivers worked with the newer OS). The Asus does edge out the Abit in FEAR by a small margin, but we suspect that's due to the sound subsystem. The Asus sports an Analog Devices HD audio codec, while the Abit uses Realtek's part. Realtek has been accused by several vendors of skimping on audio processing, which could easily account for the Abit's stronger performance.

Is this board really an improvement over the original M2N32-SLI Deluxe? Not really. It's more of a lateral move, but it could be a good choice for AMD diehards who are moving to Vista.

ASUS M2N32-SLI

THE NEW REPUBLIC
Vista features are actually nifty, and performance slightly leads the Abit.

THE OLD REPUBLIC
Mostly a recycled board first introduced last year.

9

$240, www.asus.com

WHEN A **SIDESHOW** ISN'T BAD

Is it a picture frame, media player control, or RSS reader? Asus's nifty ScreenDuo is all of the above. This small auxiliary screen gives you a directional pad and four buttons to let you interact with the dozen or so SideShow gadgets available in Vista (XP drivers and gadgets are also included). The unit is powered by a USB cable and can sit on a desk like a picture frame. You can display your images, RSS feeds, CPU temp, or even control iTunes and Windows Media Player with the device. It contains a smidgen of local RAM, so gadgets that don't require a powered up PC will work even when the machine is turned off by drawing power off the USB port. Unplugging the USB cable or switching off the PSU will turn off the ScreenDuo, though, and the drivers and applets aren't quite fully baked and the interfaces feel clumsy. We couldn't get Vista's included Sidebar gadgets to work with the ScreenDuo (something Microsoft told us should be possible). Still, the ScreenDuo is nifty, especially for folks with a fetish for always-on info. We'd like to see a more attractive version, more gadgets, and better applets, but this is a good start.

Scythe Katana 2 CPU Cooler

Like the difference between "lukewarm" and "kinda warm"

True to its name, the Katana 2 is a swift, sleek samurai sword of a cooler—at least, installation-wise. Looking at the device's actual cooling prowess, however, we're inclined to dub the cooler "butter knife."

What the device lacks in performance, it makes up for in prominence. The heatsink of the triple-heat-piped Katana 2 puts the cooler a towering 14.9cm above your CPU. We like the slanted design of the fins, and the design of the fan attachment is absolutely perfect. If the included 10cm fan isn't to your liking, you can easily exchange it for any other 2.5cm-thick fan. Customizability rules.

Better still, the Scythe is compatible with the usual round of Intel and AMD chipset designs. Much to our delight, the installation process took only about one minute—with minimal cursing to boot. There's a different mounting system for each CPU brand, but each attaches to the cooler with four tiny screws. The specific mounting clips themselves were a breeze to attach to the motherboard, and we were more than happy to exchange a brief bit of screwdriver work for such a luxury.

BENCHMARKS

	KATANA 2	STOCK COOLER
IDLE (C)	**19.5**	22.5
100% LOAD (C)	**44.5**	48

Best scores are bolded. Idle temperatures were measured after 30 minutes of inactivity, and full-load temps were measured after running CPU Burn-in for one hour.

So far, so good, right? Unfortunately, all of the Katana 2's helpful elements are absolutely worthless, as the entire point of the device is to cool your CPU. And in that, the Katana 2 doesn't quite fail miserably, but it does underperform woefully. The unit fared better than our stock cooler, but by a negligible amount. At least the Katana 2 is consistent. At idle and load, it kept our CPU temperatures about 3 degrees colder than the stock cooler.

The Katana 2 isn't much of a looker. Or a cooler, either.

While the Katana 2 is cheaper than the big boys of air cooling, paying $30 for such a small improvement seems rather pointless—especially considering the tangible performance increases other similarly priced models deliver.

—DAVID MURPHY

SCYTHE KATANA 2 **6**

$32, www.scythe-usa.com

CoolIT Eliminator CPU Cooler

One of the hottest, coldest coolers we've seen

CoolIT's Eliminator CPU cooler delivers a curious mixture of awesome and unimpressive. For as much as we love the cooler when it's at its performance peak, we absolutely hate it when it's at its ultimate low.

You can thank the Eliminator's thermal control module for this duality. The Eliminator's predecessor, the Freezone, regulated its temperature, and thus its overall cooling power, automatically. With the Eliminator, however, you're the driver. A little switch allows you to toggle between low, medium, and high settings, which changes the attached fan's speed as well as the overall power of the peltier coolers.

But what a difference that little guy makes! When set to low, the peltier-chilled water cooler couldn't even top our best air-based heatsink, Zalman's CNPS9700, which brought our FX-60 to 20 C—four degrees colder than what the Eliminator could do. And on our burn-in test, well… as you can see in the benchmark chart, we almost busted out the fire extinguisher.

BENCHMARKS

	ELIMINATOR (LOW)	ELIMINATOR (HIGH)	STOCK HSF 2
IDLE (C)	24	**2**	25
100% LOAD (C)	70	**35**	49

Best scores are bolded. Idle temperatures were measured after 30 minutes of inactivity, and full-load temps were measured after running CPU Burn-in for one hour.

Set that little switch to high and it's an entirely new ballgame. The Eliminator's idle temperatures shot down to 2 C—2 C! And the burn test brought our CPU temp down to a pleasing 35 C. That's four degrees cooler than what the—you guessed it—Zalman air-based heatsink can do.

If you don't have a 9.2cm or 12cm fan mount on the rear of your case to attach this guy, you're out of luck.

This was the third Eliminator we looked at—the first two models sent to us had defective switches that caused temps to shoot past 70 C. To its credit, CoolIT quickly got us a working unit.

But man, do we ever question the need for the Eliminator's cooling switch. If you want to water cool your CPU while you play minesweeper, hit up low. But we don't see why anyone under the sun would want to run on anything but high… unless you want your PC to become a sun of its own.

—DAVID MURPHY

COOLIT ELIMINATOR **8**

$200, www.coolitsystems.com

SilverStone Tundra TD01

We're so moving on, yeah yeah

If Maximum PC's tests worked like a beauty pageant, SilverStone's Tundra TD01 might win the swimsuit competition. Talentwise, however, this water-cooling rig would be akin to your average 18-year-old girl trying to belt out "Since You've Been Gone." It isn't horrific, but it's no Kelly Clarkson.

The 1.2-by-1-foot enclosure works wonders as an aluminum footrest, though it also doubles as a large radiator. Coolant heading out of your machine wraps around the interior of the enclosure three times before getting dumped into the TD01's 0.9-liter reservoir. Two silent submerged pumps push the coolant back out to your machine toward a single copper and acrylic water block for your Intel 775- or AMD-based CPU.

Setting up the TD01 is fundamentally the same as installing any other water-cooling setup, save for two real sticklers: removing the motherboard and attaching the block to an AMD chip with the god-awful spring-loaded screws. We definitely feared breaking our motherboard in half when trying to get those things in.

We also ran into a bit of trouble with the rig as a whole, in that nothing was pumping when we first plugged in the device. A bit of tweaking allowed us to bypass the problem—a faulty power connection—and SilverStone was speedy about getting us a replacement power cord.

BENCHMARKS

	TD01	STOCK HSF
IDLE (C)	28.5	**22.5**
100% LOAD (C)	60	**47**

Best scores are bolded. All temperatures were measured from the onboard sensors using the utilities provided by the motherboard manufacturer. Idle temperatures were measured after 30 minutes of inactivity and full-load temps were achieved by running CPU Burn-in for one hour.

The TD01 comes in both black and silver models. The hand-staining coolant, though, comes only in blue.

But even when it works, the TD01 doesn't stand toe-to-toe with equally quiet passive coolers we've tested. While it beats our stock cooler in the size category, it very much underperforms when compared to a basic air cooler, as well as other water coolers, in the simple sense that temperatures will actually rise if you use the TD01. Our CPU never reached critical levels, but it did get quite warm—at idle usage, mind you. Running a 100-percent burn made us a tad uncomfortable.

If you're all about looks, the TD01 is for you. It's a beautiful enclosure… with boo-tiful performance.

—DAVID MURPHY

SILVERSTONE TUNDRA **6**

$350, www.silverstonetek.com

Projector Pugilism

Three new video projectors enter the ring

Geek alert! The remote control for ViewSonic's PJ258D has a built-in laser pointer.

Big-screen monitors are a blast, but not even the biggest LCD, plasma, or CRT can compete with the grandeur a video projector can deliver. Games and movies running on a 30-inch monitor look downright puny compared to the 300-inch image a projector can put out. We recently had the opportunity to check out two new DLP models and one very affordable three-chip LCD.

—MICHAEL BROWN

CASIO XJ-S35

This is the projector for those who like to travel light. It's clearly targeted at the well-heeled traveling businessperson, but its high-resolution, ultraslim profile and drop-dead sexy looks render it perfect for the well-heeled traveling gamer, too.

The DLP-based XJ-S35 falls squarely into the price category of "If you have to ask, you can't afford it." OK, we'll relent: It carries a list price of $1,600. Gulp. But the XJ-S35 isn't just small, it's *tiny*; in fact, it's smaller than many notebook PCs. And Casio didn't sacrifice much in the way of features to achieve this heroin-chic formfactor: The XJ-S35 boasts an extremely bright lamp that produces 2,000 ANSI lumens, a native resolution of 1024x768, a powered 2x optical zoom lens, and a built-in USB port.

The lamp proved bright enough to easily saturate the Da-Lite Piper projection screen we used for our tests, despite being set up in a room darkened only by mini-blinds. And the zoom lens significantly reduced the setback distance from the screen: We needed just 10 feet to fill the screen's 52-inch width with gaming action. As for the USB port, you can convert your PowerPoint presentations using Casio's software, store them on a USB memory key, and present them on the projector without plugging in a notebook.

The XJ-S35 is great for business use, over the top for gaming, and suitable for television programming, but it's not the right choice if you have this big a budget for your home theater. For home use, you'll want a projector with a native 16:9 aspect ratio, and this Casio—like the ViewSonic and Epson models also reviewed here—is a 4:3 projector. However, the Epson is much less expensive than this projector and can at least emulate a 16:9 aspect ratio.

There's an inverse correlation between the Casio XJ-S35's proportions and its price tag.

CASIO XJ-S35

77 SUNSET STRIP

Powered optical zoom lens, superslim, portable, and bright.

77-YEAR-OLD STRIPPER

4:3 aspect ratio only, no S-video input, and crazy expensive.

7

$1,600, www.casio.com

VIEWSONIC PJ258D

ViewSonic has solved a problem that's been vexing video iPod users everywhere: How to best connect an iPod to a video projector. What's that? You never thought of hooking up your iPod to a video projector? Well, neither had we.

But ViewSonic's solution is pretty cool—in a geeky, insane iPod-addict sorta way: The company built an iPod dock right *into* this video projector. Our 30GB model fit snugly in the dock, even while wearing its Griffin iClear jacket, and it didn't wiggle a bit while we manipulated its control wheel.

Testing with DisplayMate's software, however, revealed two weaknesses inherent with consumer DLP projectors, including the Casio reviewed above. The first has to do with displaying subtle shades of gray. When we fired up our Extreme Grayscale test, the PJ258D did a good job of moving from black to gray, but the

SPECS

	CASIO XJ-S35	VIEWSONIC PJ258D	EPSON POWERLITE S4
PROJECTION SYSTEM	0.55-inch DLP	0.55-inch DLP	3-chip LCD
NATIVE RESOLUTION	1024x768	1024x768	800x600
ASPECT RATIO	4:3	4:3 (16:9 emulation)	4:3 (16:9 emulation)
BRIGHTNESS (ANSI LUMENS)	2,000	2,000	1,800
CONTRAST RATIO	1,800:1	2,000:1	500:1
A/V INPUTS	Analog RGB Composite Video, Component Video,* USB	Analog RGB Composite and S-Video, Component Video*, Stereo	Analog RGB Composite and S-Video, Component Video*, Stereo
WEIGHT (LBS)	3.97	3.90	5.70

** Component-to-VGA adapter not included*

The Epson PowerLite S4 also has a VGA output, which enables you to connect a separate display for monitoring your presentation.

block that moves from light gray to bright white was entirely white—there was no transition at all. The second problem surfaced in the color-bar test: The block that should have been bright yellow was closer to light mustard.

Such problems are more difficult to detect when watching typical content. The projector's picture quality with several DVDs—including the Tarsem Singh mind-bender *The Cell*—was excellent when paired with Nvidia's GeForce 8800 GTS and PureVideo decoder. Watching an episode of *Lost* from a docked iPod wasn't bad, either, but if you really want the big-screen experience, why obtain it from such a low-res source?

The ViewSonic costs $200 less than the Casio, but it is equally bright and delivers the same high native resolution of 1024x768 with a 4:3 aspect ratio.

VIEWSONIC PJ258D

7

REST STOP
Built-in iPod dock and 16:9 emulation.

REST HOME
Manual focus and zoom lens, loud cooling fan.

$1,400, www.viewsonic.com

EPSON POWERLITE S4

You could buy two Epson PowerLite S4 projectors for less than the price of a single ViewSonic PJ258D or Casio XJ-S35—and have plenty of change left over. This makes the PowerLite a compelling value, even when you consider what you'll give up in features and performance.

Resolution is the biggest sacrifice: While the ViewSonic and Casio both offer 1024x768 native resolution, the PowerLite S4 tops out at 800x600 with a native aspect ratio of 4:3 (like the ViewSonic, the Epson can emulate a 16:9 aspect ratio). This relatively low resolution accentuates the screen-door effect that all consumer LCD projectors exhibit. At 800x600, there are 480,000 pixels on the screen, compared to the 786,432 pixels that a projector with a native resolution of 1024x768 can display. Since each of the S4's individual pixels is larger, the pixel grid becomes visible in the image—as if you were looking through a screen door.

The screen-door effect was most noticeable when we viewed static photographs and during our DisplayMate benchmark routines; it was much less prevalent in our real-world game and movie tests. But we wouldn't advise making use of the projector's digital zoom, because it makes the screen-door effect much worse. The S4 did a better job of displaying color accurately, and it was far superior at distinguishing shades of gray; on the other hand, it proved unable to project a true black. This, combined with its lower overall brightness (1,800 ANSI lumens), reduced the S4's ability to display high-contrast images. If you're unable to completely darken your projection room, you'll be better off with a DLP projector. Then again, the S4 is so cheap that you could spend a couple hundred on heavy drapes and still come out ahead.

EPSON POWERLITE S4

8

ROUTE 66
Terrific price/performance ratio, good color accuracy.

ROUTE 666
Low resolution, lower contrast than DLP projectors.

$650, www.epson.com

Turntable Tussle

Let's party like it's 1984!

If you own vinyl records, you're either old enough to have collected them when they first came out (and now can't bear to throw them away) or you're a dyed-in-the-wool audiophile resolute in your belief that analog recordings are vastly superior to digital ones.

If you're the latter, you'll dismiss these two products as toys. The rest of you should consider bringing your favorite records into the digital age. Who knows? You might even decide there really is magic in those LPs, EPs, and 45s.

—MICHAEL BROWN

Don't have a soundcard but need to record from other sources? Ion's iTTUSB has an 1/8-inch stereo input, too.

AUDIO-TECHNICA AT-LP2DA

Audio-Technica has a stellar reputation as a manufacturer of pro-audio gear, and it's a major player in the Japanese consumer-electronics market. The company doesn't have much of a presence in the U.S. consumer market, but the AT-LP2Da (a package consisting of the Audio-Technica AT-PL50 turntable and Cakewalk's Pyro software) is widely available here.

The AT-PL50 has an integrated RIAA preamp, so you can plug it straight into the line-input on your PC's soundcard or onboard audio system. You can switch it off if you'd prefer to utilize your audio receiver's phono preamp (an increasingly rare feature on even midrange receivers) or if you have Creative's X-Fi Elite Pro (which comes with a break-out box equipped with an RIAA preamp).

The AT-PL50 is fabricated mostly of plastic, with the exception of its belt-driven aluminum platter and brass pulley. It features a straight tonearm with an inexpensive magnetic cartridge (replacements run about $12), nonadjustable plastic feet, and a hinged, smoke-colored dust cover.

Although this table offers very little in the way of quality features, it's push-button automatic and doesn't require much baby-sitting while you're recording. We were pleased with the sound of our recordings of Johnny Cash's 1963 LP *Ring of Fire* and Peter Gabriel's sublime 1983 album *Peter Gabriel Plays Live*, but when it came to using the bundled software to remove the inevitable pops and clicks from those recordings, we found Pyro to be a very a blunt instrument.

AUDIO-TECHNICA AT-LP2DA

SATURDAY NIGHT FEVER
Fully automatic, aluminum platter, handy dust cover, inexpensive street price.

STAYING ALIVE
Can't adjust tonearm counterweight, no skate control, limited to one type of cartridge.

7

$200, www.audio-technica.com

Audio-Technica's AT-PL50 looks very much like a traditional—and inexpensive—turntable from the 1970s.

ION AUDIO ITTUSB

Ion Audio is a division of Numark, a company that manufactures a ton of gear targeted at the professional DJ market. The iTTUSB is one of four turntables it offers that features not only a built-in phono preamp but also a USB interface. This table can perform the analog-to-digital conversion on its own and send the digitized audio to your PC via the provided USB cable.

We'd advise leaving that task to a good soundcard, but we welcome the flexibility. We also like most of the trade-offs that Ion made: Instead of spending money on an automatic tonearm and a dust cover, Ion splurged on an adjustable tonearm counterweight, a removable headshell that can accommodate a variety of cartridges, and an antiskate adjustment that will extend the life of your stylus.

The absence of even a cueing lever to drop and lift the stylus renders digitizing records with the iTTUSB pretty tedious, especially if you want to record only certain tracks. But we much prefer this table's audio quality to the Audio-Technica's.

Ion also saved money by including a copy of the open-source audio-editing program Audacity instead of commercial software like Pyro. Audacity won't burn your digitized tracks to a CD like Pyro can, but there are tons of free apps that will do that, and we found Audacity's editing tools to be far superior to Pyro's. On the other hand, we're much less enthused with this belt-driven table's plastic platter and generally gaudy looks.

ION AUDIO ITTUSB

BOOGIE NIGHTS
Strong feature set for the price.

ROLLER BOOGIE
Plastic platter, manual operation, ugly.

8

$160, www.ion-audio.com

In-the-Field Photo Storage Showdown

Don't have $1,000 for a 16GB memory card? Offload photos to a portable USB hard drive instead

The StoreJet runs on lithium ions and confirms that your files were backed up.

Flash memory prices have fallen off a cliff, but if you're on a photo safari or the vacation of a lifetime, you definitely don't want to run out of space for your images. And you sure as hell don't want to lug your 12-pound gaming notebook with you to copy your digital photos onto. So how about a tiny hard drive designed to suck pictures off your memory card? We tested two compelling options to solve your storage woes.

—GORDON MAH UNG

STARTECH INFOSAFE USB 2.0 ON-THE-GO DRIVE ENCLOSURE

It has always bothered us that in the 23rd century Starfleet couldn't do more for poor Captain Pike than that blinking light. Heck, he couldn't even Morse code "Help me… Spock!" with that blasted chair.

So in some ways, StarTech.com's InfoSafe USB 2.0 On-the-Go Drive Enclosure is actually more advanced than what Starfleet will be using a couple hundred years from now. After all, it has *three* blinking lights to tell you its status—one for disk access, one for error, and one to tell you it's full.

The aluminum InfoSafe is similar in concept and size to the generic 2.5-inch USB drive enclosures you can pick up for $20 at the corner tech store. You just add your own 2.5-inch notebook drive (with a maximum height of 9.5mm) to it. The unit doesn't have an internal battery, but you get an AC adapter and AA battery pack for field use. Slaved to your PC, it works like a standard external drive, but on its own, you can back up files from a memory card by plugging your card reader and card into the USB cable. The InfoSafe's performance is pretty peppy. Using a SanDisk Extreme USB reader rated for 18MB/s reads and a 2GB SanDisk Extreme III card rated for 20MB/s reads, we copied a card full of images in about 3:17 (min:sec). That's faster than the Transcend StoreJet OTG (reviewed below) by about 40 percent, although the comparison is a little unfair because the InfoSafe's performance will vary depending on the hard drive you choose. (We used a 5,400rpm 40GB Travelstar.)

The InfoSafe is a fancified notebook hard-drive enclosure.

Performance aside, our problem with the InfoSafe is that its threadbare Captain Pike interface sometimes left us wondering if the device had really backed up our images. Would you feel comfortable erasing that once-in-a-lifetime shot after using the InfoSafe? We sure wouldn't.

STARTECH INFOSAFE USB 2.0

LEICA M3
It's cheaper than dirt.

HOLGA 120S
Needs to have confirmation tone to convince you it actually copied your files.

6

$65, www.startech.com

TRANSCEND STOREJET OTG

If the InfoSafe is original *Star Trek*, all papier-mâché and paint, Transcend's StoreJet OTG is the first *Star Trek* movie. It's got better graphics but still has some issues.

The StoreJet comes with a 30GB drive and is about the size of a first-gen iPod. A small OLED screen lets you navigate basic functions, such as browsing folders, copying individual files, and deleting folders. You can plug a card reader or thumb drive into the unit and give it a command to back up its contents; a loud beep lets you know the task is finished. While you can't look at the actual image, the device does display the name of the file it copied. The StoreJet throws new backups into individual folders, so there's no worry about it writing over previous images or data (the InfoSafe does this as well).

This device is sturdy, easy to use, and fairly small. So what's not to like? Considering the megapixel counts and memory-card sizes available today, 30GB isn't enough storage space, especially if you're shooting RAW photos at 10MB a shot. On occasion, the StoreJet locked up on us when we removed the card reader or flash drive from its socket. It's easy to reset, and you won't lose your data, but you'll have to hunt for a thumbtack for the reset.

Overall, the StoreJet OTG is a cheaper alternative to buying 30GB worth of memory cards (small ones anyway) but not by much.

TRANSCEND STOREJET OTG

NIKON D70
Internal battery source and actual UI makes it more useful than the InfoSafe.

QUICKTAKE 100
Trails the InfoSafe in performance.

7

$230, www.transcendusa.com

Kingwin KH-350SEU Hard Drive Enclosure

When in doubt, go with the pretty lights

Do you find yourself curious about the differences between a rave and a concert? Strangely so, Kingwin's KH-350SEU external hard drive enclosure provides the perfect answer.

If you just want fancy lights alongside an experience that you probably won't remember in the morning, grab your glowst… er… this enclosure, because that's pretty much all the KH-350SEU has to separate it from everything else on the marketplace—lights.

Don't get us wrong, these lights are quite good at what they do—illuminate stuff. And functionally, they serve a legitimate purpose. The bright blue "bubble light" on one side of the enclosure stays on whenever the power's on. It's pretty. Literally on the flip side, a similar orange light flickers on and off to the tune of the enclosed hard drive's activity. It also is pretty.

And that's about it. We're serious. The USB/eSATA enclosure comes with nothing of any greater significance than those two lights—which are excellently done, we'll again note. Using eSATA, there's no additional speeding up or slowing down of the access rates between the enclosed drive and your computer (naturally, there's a performance hit for using the USB mode). The enclosure lacks a fan to keep your drive cool, and there's no front-panel display of any sort. Nothing. If the hard drive you provide is a piece of ham, then the KH-350SEU is the plain white bread that covers it.

Installation is as easy as taking a hard drive, attaching a little SATA connector, and sticking the drive into the enclosure. You also tighten four screws,

Aesthetically, this enclosure is a solid 10 Kick Ass, but…

which for the lack of anything else to write about, was a thrilling and enriching experience. The enclosure feels quite sturdy to the touch. But seeing as we like our drives in one piece, we're not quite willing to test the construction materials. We're nevertheless confident that the hard drive would break before the enclosure did.

In all seriousness, the KH-350SEU does look pretty neat. And it sure beats resting your hard drive on a stack of playing cards.

—DAVID MURPHY

KINGWIN KH-350SEU **7**

$35, www.kingwin.com

Sapphire ATI Radeon X1950 GT

Bang for the buck, but not without compromise

The X1950 GT on this Sapphire card is a stripped-down version of ATI's current best: the X1950 XTX. And it's a compelling value at $150—if you don't game at very high resolutions and don't care about DirectX 10.

The X1950 GT has 12 pixel pipelines and 36 pixel-shader units, compared to the X1950 XTX's 16 and 48, respectively. This card also has half the frame buffer—256MB—of models based on its beefier cousin. The interface to that memory, however, remains 256 bits wide. Its core clock speed is 500MHz, and its DDR3 memory runs at a strong 600MHz.

Giving up DirectX 10 support is a major sacrifice, but we keep looking at that price tag. If your videocard upgrade budget is tight, chances are good you don't have a giant monitor. We run our current videocard benchmarks at a 1920x1200 resolution on a 23-inch ViewSonic VP2330wb display. The X1950 GT is pretty feeble by that measure, mustering just 37fps with Quake 4 and a mere 28fps with FEAR.

BENCHMARKS

	X1950 GT (1920X1200)	X1950GT (1440X900)	X1950 GT IN CROSSFIRE (1920X1200)
3DMARK06 GAME1 (FPS)	8.04	13.3	11.5
3DMARK06 GAME2 (FPS)	7.51	11.4	14.2
QUAKE 4 (FPS)	37.0	56.7	69.7
FEAR (FPS)	28.0	45.0	36.0

All benchmarks run with 4x AA and 8x aniso. FEAR tested with soft shadows on; Quake 4 tested in High Quality. Cards were installed in an Asus A8R32-MVP Deluxe motherboard with AMD's dual-core 2.6GHz Athlon FX-60 and 2GB of DDR400 RAM.

The Sapphire X1950 GT is a solid performer at this price point, but we'd score it much higher if it supported DirectX 10.

But when we dialed the resolution back to 1440x900, performance jumped to 56.7fps and 45fps, respectively. Those are perfectly respectable frame rates at that resolution, which is enough to support typical 17- and 19-inch widescreen monitors. Getting that level of performance from a $150 videocard is undeniably attractive. We could have squeezed out a few more frames per second by reducing antialiasing and anisotropic filtering, but we didn't want to sacrifice image quality.

Considering that 320MB cards based on Nvidia's 8800 GTS are selling for $300, it would be foolish to buy two of these cards to run in CrossFire today. But an upgrade down the road wouldn't be a bad idea—if you're still willing to forgo DX10 support.

—MICHAEL BROWN

SAPPHIRE X1950 GT **8**

$150, www.sapphiretech.com

Audioengine 5 Speaker System

Great looks, killer sound, smart design

The Audioengine 5 is not only one of the best-sounding speaker systems we've heard in a long while, it's also one of the smartest speaker designs we've seen in the MP3-player era. These puppies will fill a room with sound, and they don't cost an arm and an ear.

Audioengine pitches this self-powered system as an iPod companion, but we think that's selling it short: The shielded speakers are compatible with any digital media player, they're a great companion for your PC, and they're a fabulous solution for a Squeezebox, Sonos, or other streaming-audio system. If you're short on outlets, you can even plug your streamer into the auxiliary AC power outlet on the back of the left cabinet. But don't be fooled by the USB port on the top of that cabinet: It won't sync your media player to the library on your PC—its sole purpose is to charge the player's battery. There's a second 1/8-inch input right next to it, so you won't need to do a reach-around or disconnect something every time you plug it in. These are handy "just what I needed" features that add value without overkill.

The Audioengine 5 boasts a long list of high-end traits: While many cabinets in this price range are fabricated from injection-molded plastic, the Audioengine 5's are constructed of one-inch-thick MDF painted an attractive semigloss black (or white). The left cabinet housing the Class AB amp (45-watts RMS per channel) tips the scales at a hefty 14 pounds (the right speaker weighs nine pounds). The speaker connections are sturdy binding posts, not cheap spring clips.

You'll want a solid surface behind each Audioengine 5 cabinet to reflect the rumbling bass that pumps out their rear ports.

Listening to Johnny Cash's "Were You There," from the original 1963 vinyl LP *Ring of Fire,* we were impressed with the Audioengine 5's ability to deliver Maybelle Carter's crystalline vocals through the 0.79-inch silk dome tweeters and Cash's thundering baritone from the five-inch Kevlar woofers without compromising either end of the spectrum. These speakers aren't quite as tight as M-Audio's discontinued Studiophile LX4 system, and we wouldn't rely on them as studio monitors, but they're great for less-critical—and more common—missions.

—MICHAEL BROWN

AUDIOENGINE 5
$350, www.audioengineusa.com
9
MAXIMUM PC KICKASS

Mojopac

Put a portable virtual machine in your pocket!

Congratulations, Mojopac. You have left us bitter and broken, but in the best way possible. For as much as we tried to find fault with, or otherwise break, your portable Windows virtualization software, we have returned from the war sans spoils. You win.

For a fairly complex piece of software, Mojopac is remarkably easy to use. You install the program onto any storage-themed external device—like a USB drive or an iPod—and that's it. In essence, Mojopac operates as a clone of your current Windows XP environment, but the primary hard drive is mapped to the external device, not the connected PC.

It's a separate operating system in the sense that you can't physically access the contents of the host computer from "Mojopac XP." Whatever you install in the Mojopac interface stays in that environment completely, never crossing over to the "real" OS. And like a facehugger, Mojopac's operating system uses the resources of the host computer.

We fired up a FEAR benchmark on our test rig and found that the game performed identically whether we launched it in the native copy of Windows or in Mojopac's version. Load times, however, will be affected by the storage device's physical connection to your rig—USB, eSATA, etc.

Mojopac isn't flawless. We couldn't get the most recent version of DirectX 9 to install on our iPod-based setup. And Mojopac's cloned Windows XP setup is highly limited, settings-wise. You can't customize video settings, and dual-monitor is a no-no. Worse, Mojopac uses the network settings of its host machine, which absolutely kills some of our favorite third-party VPN software (sorry, Hamachi).

Mojopac lets you quickly switch between the version of Windows on your PC and the one on your portable drive.

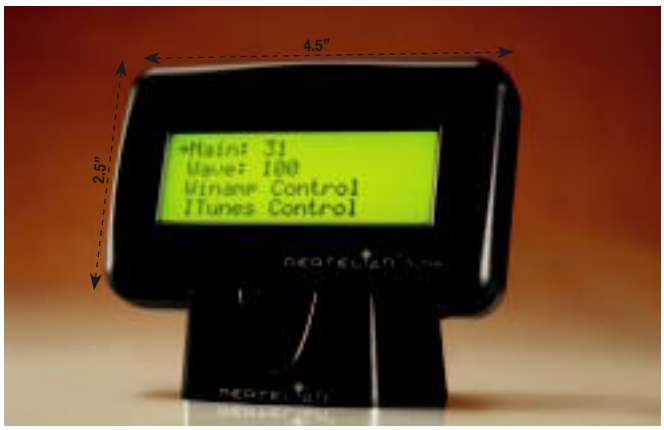
But if it's any consolation, we found ourselves actually using Mojopac to transfer sacred *Maximum PC* materials between work and home after completing our review of the product. It's a wonderful way to transport programs across multiple computing environments without leaving traces on the host machine—especially fitting for those who play video games at work, but you didn't hear that from us.

—DAVID MURPHY

MOJOPAC
$50, www.mojopac.com
9

Pertelian X2040

Welcome to the Information Age



The display isn't much to look at, but you can pack it chock-full of useful info.

Using the Pertelian X2040 display is about two steps away from having a data feed shunted into your arm as though you were one of *Battlestar Galactica*'s Cylons. If you can't bear to be disconnected from real-time information feeds, this device will keep you up to speed.

The Pertelian certainly has a geeky appeal. The device connects to your PC via USB and consists of a four-line LCD panel that serves as a scrolling meta-information display. Using a somewhat-clunky configuration utility, you can pick from a host of plugins that will output data to the Pertelian's 1-by-3-inch screen, including what's playing on your iTunes, the latest news on your favorite RSS feeds, and who's on your current TeamSpeak channel.

You can also use the Pertelian as a supplemental screen for your IM and IRC clients. Incoming instant messages will pop up on the Pertelian's screen (the client supports Gaim, Yahoo Messenger, and AIM), where your typed responses will also appear—an intriguing idea for gamers who don't want to quit conversations while fragging. In practice, it's a bit tough to navigate a flurry of IM conversations. Once you start chatting with more than one person, you're better off just alt-tabbing to your main display.

And that's assuming your IM conversations even get picked up—some don't—and you can only respond to messages; you can't initiate an IM conversation. Also, sometimes the device locks out your entire keyboard, rendering it useless until you reset the Pertelian. D'oh!

The Pertelian's accompanying software looks like it was hacked together at the last minute—and performs like it. Either the unit or the utility occasionally forgets the other exists, which forces you to restart the software, reconnect the Pertelian, or do a mad combination of both.

The device's hotkeys could also be better labeled in the utility, which would spare you from sifting through the device's lengthy PDF manual. We actually found it easier to just button-mash our way into figuring out commands for each plugin.

We definitely began to enjoy the Pertelian the more we used it, but it doesn't quite escape the event horizon that separates "neat gimmick" from "must-have device."

—DAVID MURPHY

PERTELIAN X2040 **7**

$70, www.pertelian.com

Keyspan TuneView for iPod

Clever remote for a mediocre dock

The bulbous remote feels comfortable, and the dock can accommodate an iPod wearing Griffin's iClear polycarbonate case.

We'll overlook the TuneView's biggest shortcoming—the total absence of physical support for an iPod connected to it—because it comes with a remote control that eliminates any need to manipulate the iPod while it's docked.

The docking-station component of the TuneView is as rudimentary as they come: It's equipped with 1/8-inch stereo and S-video outputs and a USB port that's used to either sync the iPod to your PC *or* power the dock and charge your iPod—but you can't do both at the same time. Power is supplied by Keyspan's weird-but-cool USB power adapter. (Plug the adapter into an AC outlet, plug a USB cable into the adapter, and you can charge the battery in any device that accepts power over USB.)

The remote control, on the other hand, is pretty slick: It's capable of not only controlling a docked iPod, but also receiving data *from* the iPod. It features a 1.4-inch LCD that is capable of displaying most of the information your iPod knows about the music stored on it. Using the remote, you can browse your music collection by song, genre, artist, album, and playlist as if you were holding the iPod. And since it uses the 2.4GHz band, there's no line-of-sight requirement.

The remote's passive-matrix display doesn't deliver the ultrafast response times or high contrast we take for granted in active-matrix displays, but it's good enough for this application. Hand us a remote with a built-in display, however, and we're bound to compare it to the Sonos Digital Music System—and to the iPod itself, for that matter (pair your iPod with a Bluetooth transceiver, and the iPod becomes a remote in and of itself). The TuneView suffers in these comparisons: The fact that the remote can't display album art is more the fault of Apple than it is of Keyspan, but the buttons feel plasticky and cheap. That's not what we expect from a $180 device; even so, the remote renders this one of the best docking solutions we've tested.

—MICHAEL BROWN

KEYSPAN TUNEVIEW **8**

$180, www.keyspan.com

Adobe Photoshop Elements 5.0 and Premiere Elements 3.0

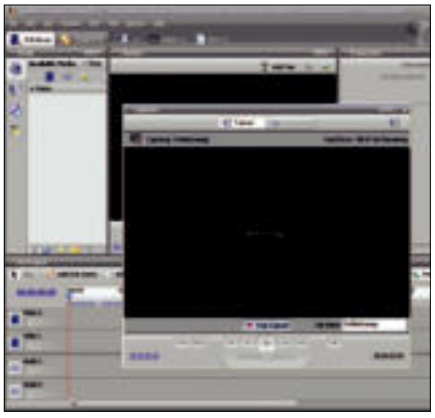
The Elements twins get older but not necessarily wiser

If you've been computing long enough, you can probably tick off some of life's touchstones that occurred around the time of each major Photoshop revision and on occasion tell yourself, "Wow, I remember when Photoshop was just born, err, released."

To make you feel even older, Photoshop's and Premiere's offspring are well on their way to becoming grown-ups too. Photoshop Elements has now hit 5.0, and Premiere Elements has reached 3.0. But are these applications growing up to be as well groomed as their parents, or are they destined to work at the Quick Stop with Dante and Randal?

As the older of the two, Photoshop Elements 5.0 appears to get most of the attention from the revision bump. You now get finer control over black-and-white conversion and curves as well as the capability to correct for barrel distortion and corner vignetting. The organizer side of Elements also gets a healthy dose of new layout options, including album pages, a flipbook effect, and online backups of your photos.

Black-and-white conversion gets a makeover, but it still falls a little short for power users.



Premiere Elements 3.0's inability to preview HDV content is a letdown.

One thing that irks us about PE5 is the number of services Adobe pushes your way. The online backup uses Iron Mountain Digital, which you get for free for a whole 30 days! Yippee! Want to upload a photo stamp or create an photo book? You have to pay for those too. We're not asking for free services, as we know you can't get stamps for free, but at times, it feels like Photoshop Elements is just a middleman that takes you to other sites where you'll need to have your credit card ready.

If you can avoid all the add-in services, it's pretty apparent that the DNA of Photoshop is still in Elements. But while perspective correction is somewhat effective, as with many PE5 features, you always feel as though you want to crank it up a notch, and the program just won't let you. And when the scripts don't quite work, newbies are left to fend for themselves in the cold, cold land of Photoshop layer hell.

The younger of the two programs, Premiere Elements 3.0, gets fewer apparent updates, but the major change is aimed at user friendliness. We lauded the previous version for being Premiere Pro with training wheels, and Adobe tries to make the app even easier to use here. Unfortunately, one of the major fixes doesn't work for us. Adobe added a new storyboard view, but not all of the features work. For example, we included a title overlay in timeline view, switched to storyboard view, and then found that it didn't display our title. We stayed in the timeline view for the rest of our project.

Adobe is finally touting the ability to capture and edit HDV-resolution material, but the company neglects to mention that the feature is half-assed. The preview window and scene detection don't work, so if you want just one scene, you have to queue it up on your camera and manually capture it or capture the entire tape and hunt for your footage. That's pretty pathetic. Even weaker, there's no support for burning to Blu-ray or HD DVD drives. You just output to MPEG-2 and find some other way to publish your HDV content.

These issues aside, we found it hard to hate Premiere Elements 3.0, because so much of what we liked in the previous version is still here. Performance is quite good, thanks to the Premiere Pro DNA. While it took several hours to encode our 20-minute project on a dual-core Athlon 64 FX-60, at least it pegged both cores through the process.

That leaves us a little torn. We gave the previous bundle a 9 verdict and a Kick Ass award for being so feature complete and powerful. You don't lose any of the features or power with this bundle, but it's just not as satisfying as the last upgrade. Both applications are like children who have just turned into awkward teenagers. We think it's probably a phase they'll grow out of, but sometimes you never know.

—GORDON MAH UNG

PHOTOSHOP & PREMIERE ELEMENTS

AVENGERS

Powerful with enough features to satisfy most people's needs.

DEFENDERS

Feels a little bloated at times, and Photoshop Elements suffers from module overload.

8

$150, www.adobe.com

War Front: Turning Point

This could be your father's RTS

War Front has the dubious honor of being the first RTS we played after SupCom (hereafter this period will be known as A.S.). Fair or not, SupCom raised our expectations, and War Front just doesn't measure up—in fact, it feels like a bit of a fossil.

However, like the old rocks at your local museum, at least it's been cleaned and polished to shine for those who care to take a trip down memory lane for some old-school fun.

The game is set in WWII, but before you turn the page groaning, it is at least an alternate WWII—one in which the United States, Britain, and Germany must team up to thwart a Soviet menace. The "alternate" setting also means that the units you get to wage war with are only loosely based on their historical counterparts, so you get access to all sorts of cool toys that Hitler and his cronies could perhaps envision but not create. We're talking about things like sonic and ice-spitter tanks, mobile shield generators, jetpack soldiers, burrowing tanks, and delta-winged bombers.

The units look great, and everything on the screen blows up real good—War Front's gameplay may be archaic, but its pyrotechnics are modern day. The three factions' armies are visually distinct but functionally similar, which means battles are fairly balanced.

The game's story unfolds over the course of two 11-mission campaigns in which you see events through the eyes of the Allies' leading hero, John Lynch, and then Germany's Roland Hellman—Schwarzenegger protégés rife with bravado and cliché. The story is well told, with copious entertaining cutscenes that the repetitive missions cannot quite live up to. Most missions require you to eradicate an enemy base from the map to move on… yawn. And if you've played any RTS from the late '90s forward, you'll find little that is new.

He who gathers the most resources the fastest usually wins. Many missions devolve into somewhat tedious mop-up exercises.

The multiplayer offerings are rich, however—up to 10 people can play a single game online, and there are a few interesting game modes in addition to the standard deathmatch options.

—STEVE KLETT

WAR FRONT **7**

$40, www.war-front.com
ESRB: T

Jade Empire

Yes, you can fight like the Drunken Master

Like Midas, anything BioWare touches turns to gold. And Jade Empire, the latest Xbox port to hit the computer scene, is no exception. It's no Knights of the Old Republic, but it certainly reminds us of the epic RPG, with enough feudal-themed creativity added in to make for fresh moments throughout its seven chapters of gameplay.

The story line is reminiscent of a kung fu movie's—assassins attack your martial arts school, your mentor goes missing after revealing a substantial plot device, and you're left to pick up the pieces.

But part of the fun comes from the light side/dark side–style choices you have to make in your quest. Your morality doesn't greatly influence your traveling companions, as it does in *KOTOR 2*, but it does make for some great in-game moments. We even hummed the Imperial march when Murph the Monk helped slaughter a host of slaves because they were too weak to be "worth saving."

Mashing the attack button typically results in a surefire victory in the game's earlier chapters, but we were pleased to see a bit of AI development as Jade Empire progressed. Sure, the red shirts still love the taste of your knuckle sandwiches, but if you try to go willy-nilly on a boss without any kind of blocking strategy, you're apt to get served.

It's a shame said traveling companions are utterly worthless when it comes time to throw down. Their poor attack skills almost match their fairly useless "support" function. We still love their unique story lines, even though the addition of an underdeveloped merchant character who gives you a storefront no matter where you are in-game is a total cop-out.

But BioWare didn't scrimp on cutscenes—Jade Empire has *a ton*. Their constant use throughout the game creates a frustrating stop-and-go effect, and their prerendered quality left us a bit disappointed. On the plus side, the voice acting is absolutely spot on, and the beautiful in-game scenery helped keep us happy even when we were fighting a challenging boss.

Dodging in Jade Empire turns your character into an Olympic gymnast, sans pommel horse.

Jade Empire has equal parts story and smash-'em-up action. And while it's not a perfect port, you won't be disappointed by the combination of story and action that it delivers.

—DAVID MURPHY

JADE EMPIRE **8**

$40, www.bioware.com
ESRB: M

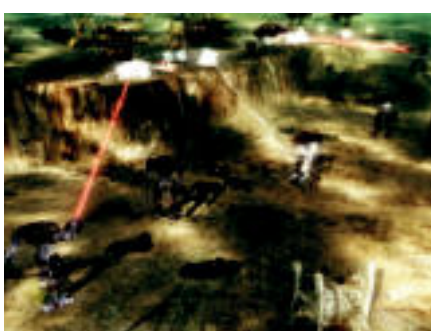
Command & Conquer 3: Tiberium Wars

What if Jerry Bruckheimer designed a strategy game?

Tiberium Wars picks up on the long-running conflict between Global Defense Initiative (GDI) and Brotherhood of Nod forces on a Tiberium-infested Earth. Over the course of three-dozen missions, you side with each of the game's three factions, waging war to protect the citizens of Earth, spreading the word of the prophetic Kane, and freaking everyone out with an alien invasion. *Independence Day,* eat your heart out.

High-quality cinematic cutscenes (in HD resolution) and plenty of in-game scripted narratives and informational videos kept us absorbed in the plot and made mission objectives more compelling. The B-list actors give adequate performances, but it's Joe Kucan's reprisal of his role as Kane that sells the show. His over-the-top performance sets the perfect tone for the action and TNT-powered gameplay.

Most of the missions are of the typical assault-and-capture design that requires blowing up the opposition's base and capturing key points, like the White House or a nuclear missile silo. We liked that many of these battles feature story-relevant countdown timers (i.e., a missile launch) to hasten the pace and create a sense of urgency. The game also has plenty of hold-and-defend missions in which you're required to repel a massive assaulting force or escort a VIP across the battlefield, which necessitates building garrisons and scouting terrain (while still blowing stuff up along the way). Finally, commando missions give you only one supersoldier to infiltrate an enemy base—and blow it up. Our favorite is the GDI commando, an impressive one-man wrecking crew able to wipe out entire strongholds alone.



Walkers are the best units for each side, but they have an Achilles' heel.

RTS veterans will feel the missions are a bit dumbed down, but the game's excellent map design, brilliant environment models, and snazzy visual effects sufficiently amp up the gameplay. We love the way the tumultuous future is rendered—crumbling cityscapes from every part of the world are meticulously detailed with dilapidated buildings and abandoned superhighways. The Red Zones (areas where Tiberium has engulfed the landscape) are especially cool; the glowing green crystals make the environment look almost alien. The only problem we faced was that the buildings and terrain sometimes affected unit pathfinding, splitting up control groups and infantry squads midmarch. The solution: Blow up the obstacles.

A tank with two barrels? That's unpossible!

The Scrin show their legs in Tiberium and take in more resources per crystal.

Speaking of units, we were pleased to find a diverse selection of build options for each side, which gave each faction a distinctive flavor. The GDI rely on tech upgrades to overpower their enemies through brute force—a dozen rail-gun-equipped Mammoth tanks and Zone Trooper–garrisoned APCs will easily overrun any defense. The suicidal Nod units are cheaper and weaker, so you'll have to use rush and raid more often to win rounds with them. A third faction, the alien Scrin, appears near the end of the game and utilizes futuristic tripod walkers of death and beefier damage potential to vaporize the enemy. Since games are brief (each lasts about 20 minutes), strategy boils down to building your force quickly and overwhelming your foe with superior numbers.

We fully enjoyed the explosive action of Tiberium War's single-player campaign—the game has a Hollywood blockbuster look and feel. Unfortunately, the visual flair comes at the cost of tactical depth and innovations in strategy. Tiberium War is the best Command & Conquer game to date, but it can't hold its own against the hardcore likes of Supreme Commander and Company of Heroes.

—NORMAN CHAN

COMMAND & CONQUER 3

CONQUER

Breathtaking visuals anchor the fun single-player campaign.

SURRENDER

Simple strategic options and small maps limit complexity.

8

$50, www.commandandconquer.com
ESRB: T

Win Rig of the Month AND WIN BIG!

IF YOUR MODDED PC IS CHOSEN AS A RIG OF THE MONTH, IT WILL:

1 Be featured before all the world in *Maximum PC*
2 Win you a $500 gift certificate for Buy.com

TO ENTER: Your submission packet must contain your name, street address, and daytime phone number; no fewer than three high-res JPEGs (minimum size 1024x768) of your modified PC; and a 300-word description of what your PC represents and how it was modified. Emailed submissions should be sent to **rig@maximumpc.com.** Snail mail submissions should be sent to Rig of the Month, c/o Maximum PC, 4000 Shoreline Court, Suite 400, South San Francisco, CA 94080.

The judges will be *Maximum PC* editors, and they will base their decision on the following criteria: creativity and craftsmanship.

ONE ENTRY PER HOUSEHOLD. Your contest entry will be valid until (1) six months after its submission or (2) October 15, 2007, whichever date is earlier. Each month a winner will be chosen from the existing pool of valid entries, and featured in the Rig of the Month department of the magazine. The final winner in this contest will be announced in the December 2007 issue. Each of the judging criteria (creativity and craftsmanship) will be weighed equally at 50 percent. By entering this contest you agree that Future US, Inc. may use your name and your mod's likeness for promotional purposes without further payment. All prizes will be awarded and no minimum number of entries is required. Prizes won by minors will be awarded to their parents or legal guardians. Future US, Inc. is not responsible for damages or expenses that the winners might incur as a result of the Contest or the receipt of a prize, and winners are responsible for income taxes based on the value of the prize received. A list of winners may also be obtained by sending a stamped, self-addressed envelope to Future US, Inc. c/o Maximum PC Rig of the Month, 4000 Shoreline Ct, Suite 400, South San Francisco, CA 94080. This contest is limited to residents of the United States. No purchase necessary; void in Arizona, Maryland, Vermont, Puerto Rico, and where prohibited by law.

We tackle tough reader questions on...

✓Vista Upgrades ✓Holographic Storage ✓Dual Dual-Booting ✓Lossless Audio

FORGET STORAGE, I WANT THE HOLODECK!

You had a white paper on holographic storage in the April 2007 issue. This storage system's large capacity and speed interest me because I watch movies from my hard drive. (I really hate having to get up and switch DVDs.) But hard drives go bad every few years, and to get any real capacity—2TB or more—you have to build a RAID. If one drive goes bad, I'm screwed. Will holographic storage have a long life, or will it be like the hard drives we have now.

—John Myers

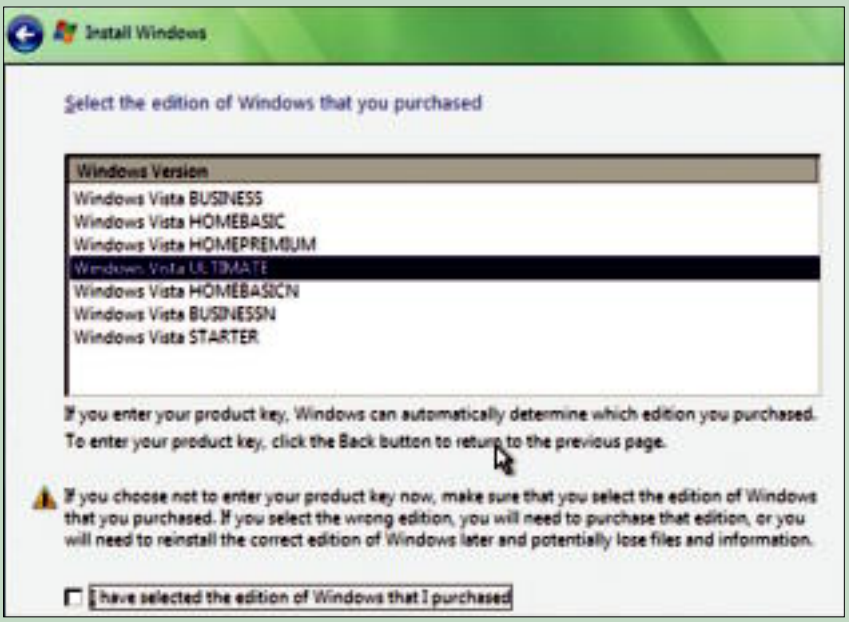
EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: Hard drives eventually fail because they have so many moving parts. If the read/write head crashes into the spinning disk, it will cause irreparable damage to the data stored on the drive. Holographic storage is more like CD and DVD technology: The drive mechanism still has moving parts, but even a catastrophic failure would be unlikely to damage the media because its read/write component never comes into contact with the drive. The media is not impervious to age, however; it's expected to have a 50-year life span.

AND A DOUBLE DUAL-BOOT FOR YOU, TOO, SIR!

*I have been reading **Maximum PC** for years and have been closely following all your articles about Vista. Due to game- and application-compatibility issues mentioned in those articles, when I move to Vista, I plan on taking my current dual-OS system and expanding it to three operating systems. Currently, I'm running two versions of Windows XP—one configured for gaming, the other for office productivity.*

*One subject that I have not seen mentioned in any **Maximum PC** article is dual- or triple-booting with Vista. Would it be possible for you to educate readers on different dual-boot configurations using Vista?*

When I move to Vista (Ultimate Edition), I would like to create one Vista gaming load and one Vista Office load and maintain one Windows XP gaming



Vista Upgrade Shenanigans

In the April 2007 issue, Will gave me yet another reason not to upgrade to Vista: the ability to upgrade from WinXP is gimped. However, two pages later, you say you can install a Vista upgrade by using the upgrade to first install a "working OS" and then reinstall the upgrade over that. This seems a bit confusing; can you clarify?

By the way, no matter which is correct, Microsoft's stupidity has become apparent for all to see. I just like to have my facts straight when I explain to people how they're getting screwed.

—Steve

EDITOR IN CHIEF WILL SMITH RESPONDS: I should have been clearer when I explained how to bypass the upgrade problem. Here's what you have to do. First, back up your Windows XP installation to ensure that you have all your data and files. Then boot off of the Windows Vista DVD and start the installation process. However, when you're prompted to enter your activation key, don't. The installer will ask you to confirm that you want to install Windows sans key, which you'll have to do; then you'll be asked to choose which version of Vista you want to install. It's crucial that you select the same version you paid for! Go ahead and complete the install; once Vista's installed, you'll have to start the installer from the CD and perform a standard upgrade in which you enter the correct activation code. It's wonderful when a piece of software makes an already annoying task even more difficult, isn't it?

load for any games that are incompatible or do not run as nicely under Vista. They will all be installed on one system.

When I do this, will I need to purchase two copies of Vista, or can I use one license since I will be installing it on the same physical computer twice.

—Terence Sweeny

ASSOCIATE EDITOR DAVE "THE MURPH" MURPHY RESPONDS: We're actually a bit curious as to why you'd want to run two versions of Vista in the first place. Unless you have a ton of programs launching on startup, there shouldn't be any measurable performance difference. Or, at least, we can't possibly fathom the kinds of applications you're running that would slow Vista to a crawl. Even if your system is totally crapping out, a fresh reboot should be able to fix the problem in a heartbeat.

I only suggest this because installing one copy of Vista on two separate drives—at least, as far as my *Law & Order*–informed legal skills can ascertain—violates Microsoft's EULA, which allows you to slap your copy of Vista on *one* of your "licensed devices." According to the EULA, "a hardware partition or blade is considered to be a separate device." So if you want two versions of Vista on your rig, you're supposed to buy two copies of it.

In regard to dual-booting Vista and XP, you'll be pleasantly surprised to find a description of just how to do that in this month's Ask the Doctor. We also addressed the issue on the official *Maximum PC* podcast No. 6, which you already should have listened to. That goes for all of you—in your car, in your house, on the way to work, in the shower, everywhere. Start now at www.maximumpc.com.

DOES MAXIMUM PC HATE MONKEYS?

What happened to Monkey's Audio in your lossless compression comparison? It's widely considered to be the best lossless codec out there—especially in the underground file-sharing scene. FLAC was considered obsolete a few years ago, but then hardware devices started supporting it, which gave it new life.

—Jan Kata

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: We have nothing against Monkey's Audio, but we do hate monkeys. We chose to compare Apple Lossless, FLAC, and WMA Lossless for the simple reason that all three of those formats are supported by at least one non-PC audio player (either a handheld player or an audio-streaming device).

MAYBE IT WAS JUST OUR SCREW THAT WAS LOOSE

I'm just writing a short letter to inform you of an error in your article "Build the World's Best $1,500 PC" in the February 2007 issue. In Step 7 on page 27, you recommend removing the generic I/O shield from a case by hammering at it with the back of a screwdriver. I've built several computers using cases in which the generic I/O shield was attached using two screws. This is especially common in Apevia/Aspire cases. Hammering at the I/O shield would bend the metal and damage the case. Users should be instructed to check for screws before "hammering" at the case, potentially causing damage and making it difficult to attach the I/O shield included with the motherboard.

—Glen Slawsky

SENIOR EDITOR GORDON MAH UNG RESPONDS: Wow, it's been a long, long time since I've seen an I/O shield screwed down in an ATX case. Even the last Apevia/Aspire I tinkered with—the X-Navigator Aluminum—did not have the I/O shield screwed down. From reading the ATX spec though, I don't see any prohibition on screwing it down. Regardless, you are correct—you should examine the case to determine whether the I/O shield is screwed down. MPC

LETTERS POLICY: *MAXIMUM PC* invites your thoughts and comments. Send them to **input@maximumpc.com.** Please include your full name, town, and telephone number, and limit your letter to 300 words. Letters may be edited for space and clarity. Due to the vast amount of e-mail we receive, we cannot personally respond to each letter.

COMING NEXT MONTH

IN MAXIMUMPC'S FOR EXTERNAL USE ONLY JUNE ISSUE

UPGRADES YOU DIDN'T KNOW YOU NEEDED!!

We're all aware of the obvious upgrades we can make to our PCs—a larger hard drive, a faster CPU, a DX10 video-card—but numerous often-overlooked products can also enhance our computing experience. Discover these hidden gems next month.

LIVING LA VIDA LINUX

With Vista looming on your horizon like a big, dark cloud, it's time to give Linux a second look. And the truth is, there's never been a better time than now to make the switch. We'll show you just how easy it is to make Linux deliver all the power of Windows and more!

MAXIMUM PC CHALLENGE

Next month, a crack team of *Maximum PC* editors tries to undermine, bypass, and break free from the protective measures of three popular parental-control apps. Will they succeed in doing what they damn well please on the Internet? Find out.

JOHN SILIS'S

Weatherproof Rig

This rig wouldn't get a second glance from most people—and that's just how John Silis wants it. After seeing news reports of vandalism in his neighborhood, John decided to harness the power of technology to take a bite out of crime by installing a surveillance rig inside a 12x12x6 plastic electrical junction box.

At *Maximum PC*, we believe in real-world testing, and John did not disappoint. To simulate potential abuse from vandals and inclement weather, John handed out baseball bats, rocks, and a garden hose to the neighborhood kids and let them go to town on the Weatherproof Rig. It survived the onslaught with nary a scratch—and kept running. Word of advice, John, don't let those kids near your gaming rig!

Computer? What computer? Waterproof baffles keep out the rain and bugs, and two 92mm fans keep this rig cool under the Florida sun.

Inside, rubber grommets act as shock mounts for the mobo and hard drives. The rig can be controlled via either Remote Desktop or an RF keyboard and a 2.4GHz video transmitter.

Power supply? We don't need no stinkin' power supply. John can trade out his Micro 320-watt PSU and run this rig off the solar panels you see here and two golf-cart batteries.

John's Eclipse card can run up to 16 cameras. Right now, he's running four; he plans to set the rig up for his landlord at a nearby apartment building.

For his winning entry, John wins a $500 gift certificate for Buy.com to fund his modding madness! See all the hardware deals at www.buy.com, and turn to page 92 for contest rules.

If you have a contender for Rig of the Month, e-mail **rig@maximumpc.com** with high-res digital pics and a 300-word write-up.

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